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CORE LIST

# Guidelines for the chemical control of plant diseases and nematodes

AGRICULTURAL RESEARCH SERVICE • U.S. DEPARTMENT OF AGRICULTURE • AGRICULTURE HANDBOOK NO. 378



## USDA POLICY ON PEST CONTROL

It is the policy of the Department of Agriculture to practice and encourage the use of those means of practicable, effective pest control which result in maximal protection against pests, and the least potential hazard to man, his animals, wildlife, and the other components of the natural environment.

Nonchemical methods of pest control, biological or cultural, will be used and recommended whenever such methods are economically feasible and effective for the control or elimination of pests. When nonchemical control methods are not adequate, integrated control systems utilizing both chemical and nonchemical techniques will be used and recommended in the interest of maximum effectiveness and safety.

Where chemicals are required for pest control, patterns of use, methods of application and formulations which will most effectively limit the impact of the chemicals to the target organisms shall be used and recommended. In the use of these chemicals, the Department has a continuing concern for human health and well-being and for the protection of fish and wildlife, soil, air, and water from pesticide contamination.

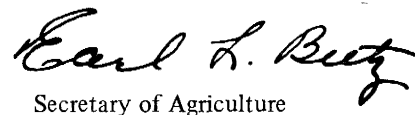
In keeping with this concern, persistent pesticides will not be used in Department pest control programs when an equally safe and effective nonresidual method of control is judged to be feasible. When persistent pesticides are essential to combat pests, they will be used in minimal effective amounts, and applied only to the infested area at minimal effective frequencies.

In carrying out its responsibilities, the Department will continue to:

- Conduct and support cooperative research to find new, effective biological, cultural, and integrated pest control materials and methods;
- Seek effective, specific, nonpersistent pesticides and methods of application that provide maximal benefits and are least hazardous to man and his environment;
- Cooperate with other public and private organizations and industry in the development and evaluation of pest control materials and methods, assessment of benefits and potential hazards in control operations, monitoring for pesticide residues, and dissemination of pesticide safety information.

All users of pesticides are strongly urged to heed label directions and exercise constant care in pesticide application, storage, and disposal for the protection of people, animals, and our total environment.

The Department commends this policy to all who are concerned with pest control.

  
Secretary of Agriculture

## PREFACE

This handbook provides guidelines for the use of chemicals that may be used for the control of plant diseases and nematodes. It is not intended to provide recommendations to be followed directly by the individual users of chemicals. It is provided as an informational source for those who are responsible for developing specific use recommendations for pest control chemicals. Regulations are valid as of text page date.

Omission or inclusion of a chemical does not imply judgment as to its efficacy. Inclusion of a chemical is based partly on the extent to which it is actually used. A chemical may have been omitted because, although registered for a given purpose, it is mentioned only infrequently or not at all in published control recommendations.

The chemicals included in this handbook were registered by the Federal Environmental Protection Agency (EPA) as of December 1972. These chemicals are currently being rather widely and effectively used in accordance with the published control recommendations.

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) as amended by the Federal Environmental Pesticide Control Act (FEPCA) requires that all pesticide products (formulations) be registered by EPA before entry into intrastate or interstate commerce. In addition, the individual States may have special registration and use requirements for pesticides. FEPCA provides for civil or criminal penalties for the misuse of pesticides. Use of nonregistered pesticides or use in violation of the directions on the label are punishable.

The technical information in this publication was evaluated, compiled, and reviewed by Hilde McGrath and Julius Feldmesser, and also by Paul R. Miller, Harry Keil, Joseph Good, and associated personnel of the Plant Protection

Institute, the Plant Genetics and Germplasm Institute, and the Agricultural Marketing Institute of the Agricultural Research Service, and the Division of Forest Pest Control of the Forest Service, U.S. Department of Agriculture. Helpful suggestions and reviews were made by plant pathologists, nematologists, and other scientists in the Extension Service, the Cooperative State Research Service, and other agencies of the U.S. Department of Agriculture; in the State agricultural experiment stations; in the Environmental Protection Agency; in the U.S. Department of Health, Education, and Welfare; and in the U.S. Department of the Interior.

Thanks are expressed to Edward P. Carter and his associates, of the Environmental Protection Agency, for their suggestions and criticisms during preparation of this publication, and for making their information files available.

This handbook has been prepared in a loose-leaf form so that it may be periodically updated as needed. Subscribers to this handbook will receive the updated pages as they are printed.

This publication is divided into three sections, coded 1, 2, and 3.

1. An introduction, a statement on the Federal Environmental Pesticide Control Act of 1972, precautions, and an explanation of the tables and terminology used in the rest of this publication.
2. Plant disease section including a fungicide index and toxicity table, tables with suggested fungicide uses arranged under crop headings, and lists of suggested seed treatments.
3. Nematicide section including general information on nematicides, a nematicide index, toxicity tables, summarized lists of suggested uses, and nematicide tables with suggested uses arranged under crop headings.



*Use Pesticides Safely*  
FOLLOW THE LABEL

U.S. DEPARTMENT OF AGRICULTURE

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# GUIDELINES FOR CHEMICAL CONTROL OF PLANT DISEASES AND NEMATODES

Prepared by Agricultural Research Service

## INTRODUCTION

Plant diseases and nematodes cause damage to crops that reduces the quantity and quality of the product. The total annual losses in agricultural production from plant diseases and plant-parasitic nematodes in the United States alone is estimated to amount to 10 and 7 percent, respectively, despite the widespread use of control methods on important crops. Obviously, without controls, the losses would be much greater, even disastrous, under conditions optimal for damage.

Control methods include: The use of disease- and nematode-resistant varieties; cultural methods such as deep plowing to bury infested debris; changing time of planting, or manipulating moisture supply; production of disease- and nematode-free seed and plants in locations free from the disorders; biological control to take advantage of interactions among soil-inhabiting organisms; and use of chemicals. Only chemical methods of control are included in this handbook. Nonchemical methods of control are discussed in publications on crop production.

The cost of controlling diseases and nematodes is considerable but difficult to estimate. The annual cost of nematode control, including nematicides and application, in the United States is estimated at 40 to 50 million dollars. The cost of chemical control of plant diseases is estimated at 107 million dollars annually. These figures indicate the importance of chemicals in agricultural production, as well as the extent of the problem involved in assuring safety to users of the chemicals, to crops on which the chemicals are used, and to consumers of the treated product.

Pesticides, including the fungicides, bactericides, and nematicides with which we are concerned, must be used to assure production of enough food and fiber to supply an ever-increasing world population. Many of the most

effective chemicals if used improperly can be injurious to man, animals, and plants. The potential hazards involved in their use can be minimized by proper care and caution.

Permissible residues, designated as tolerances, are expressed in terms of parts per million (*ppm*) of actual chemical. Until the end of 1967, many agricultural chemicals used on food or feed crops were accepted for registration on a "no-residue" or "zero-tolerance" basis. Since then, new analytic procedures have made possible the detection of minute traces of chemicals previously not detectable with methods used when the products were first registered. In addition, toxicological studies have shown that some agricultural chemicals may have unfavorable effects on humans and other nontarget parts of the environment. With the change from "no residue" and "zero tolerance" registrations to the requirement for residue tolerances many registrations were canceled because of the lack of data upon which to base the tolerance. Many of the cancellations affected older compounds of limited use. In most cases substitute chemicals are available for the same uses. The agricultural industry, growers, and scientists in the USDA and State agencies who initiate and develop specific uses for pesticides in soil and on or around crop plants are notified of the cancellations so that they can make any necessary adjustments in control actions.

Two important questions that must be answered are: Will the product be effective for its proposed use? Even more important—Will it be safe when used as directed? If the answer to the latter question is "no," the product will not be registered, regardless of its effectiveness. Pesticide regulations and strict enforcement keep residues at levels low enough not to hamper international trade in food products.

Most combinations, mixtures, and mixed schedules of different chemicals have been omitted. Sulfur and most copper compounds are exempt from the

requirement of tolerances, but not from registration requirement. They are usually omitted but are listed sometimes because one or the other is the only chemical treatment available for control of an important disease.

It was not possible to include all fungicides registered for some of the major diseases of important crops.

Registrations of all suggested uses of pesticides in this publication were in effect on December 31, 1972. Registrations of pesticides may change as new information on uses and residues becomes available. New uses are frequently added to labels and old ones are sometimes deleted or canceled. In order to use pesticides effectively and safely, the user must follow *up-to-date labels and label instructions*. Because new pesticides and new uses for old ones are being developed constantly, it is important to obtain the latest information from the USDA, the EPA, the State agricultural experiment stations and extension services, and manufacturers of specific products. *Read the label carefully and follow the instructions.*

## THE FEDERAL ENVIRONMENTAL PESTICIDE CONTROL ACT OF 1972

The Federal Environmental Pesticide Control Act (FEPCA) of 1972 became law on October 21, 1972, revising the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) of 1947.

Some sections of the new Act became effective immediately, while others have deadlines for later enforcement, pending the establishment of regulations and development of Federal standards to guide States in implementing the legislation. All of the provisions of the new Act must be in effect by October 1976.

Before registration may be granted for a pesticide product, the manufacturer is required to provide scientific evidence that the product, when used as directed, will (1) effectively control the pest(s) listed on the label, (2) not injure humans, crops, livestock, wildlife, or damage the total environment, and (3) not result in illegal residues in food or feed.

The FIFRA was administered by the Department of Agriculture until the authority was transferred to the Environmental Protection Agency (EPA) when it was established in December 1970. The administering Agency has authority to cancel a pesticide registration when the registered use of the product is in violation of the Act or poses a serious hazard to humans or their environment. The registrant is entitled to appeal the cancellation notice

through a process that can include public hearings and scientific advisory committees.

Suspension of a pesticide registration, unlike cancellation, halts interstate shipments immediately and is reserved for those products that present an imminent hazard.

The Pesticide Amendment to the Federal Food, Drug, and Cosmetic Act is a law closely related to the FIFRA and FEPCA. It provides protection to consumers from harmful pesticide residues in food. The Amendment requires that, where necessary to protect the public health, a tolerance or legal limit be established for any residues that might remain in or on a harvested food or feed crop as a result of the application of a chemical for pest control. Tolerances are based on chemical and toxicological data showing that the residues are safe for consumption.

The authority to establish tolerance levels was transferred from the Food and Drug Administration to EPA in December 1970. The enforcement of tolerances remains the responsibility of the Food and Drug Administration of the Department of Health, Education, and Welfare.

## Provisions of the New Law

Some of the provisions of the 1972 Act are:

- \* The use of any registered pesticide in a manner inconsistent with labeling instructions is prohibited, effective immediately. Civil and criminal penalties for misuse of pesticides are provided.
- \* Known violations of the Act by farmers or other private applicators can result in fines of up to \$1,000.00 or 30 days imprisonment or both. Second and subsequent offenses are subject to fines of up to \$1,000.00.
- \* Any registrant, commercial applicator, wholesaler, dealer, retailer, or other distributor who knowingly violates the law is liable to a \$5,000.00 or \$25,000.00 criminal fine or one year in prison or both.
- \* Pesticides must be classified for general use or restricted use by October 1976.
- \* The States will certify pesticide applicators for use of restricted pesticides. The Act allows four years for development of certification programs. Federal standards for certification must be set forth by October 1973, and the States must submit their certification programs based on these standards by 1975. The State programs must be approved within one year of submission.

- \* The Administrator may issue orders stopping the sale, use, and/or requiring the removal of any product when it appears that the product is in violation of the Act or the registration has been suspended and finally canceled. Products in violation of the Act may also be seized.
- \* Pesticide manufacturing plants must be registered by October 1974.
- \* EPA is required to develop procedures and regulations for the storage and disposal of pesticide containers. They must accept at convenient locations for disposal, pesticides which have had registrations suspended and then canceled.
- \* The Agency is authorized to issue experimental permits, conduct research on pesticides and alternatives, and monitor pesticide use and presence in the environment.
- \* The owners of certain pesticides where registrations are suspended and finally canceled are entitled to indemnification.
- \* States are authorized to issue limited registrations for pesticides intended for special local needs.
- \* States may impose more stringent regulations on pesticides than the Federal Government, except for packaging and labeling.
- \* The views of the Secretary of Agriculture are required to be solicited before the publishing of regulations under the Act.
- \* Federal registration of *all* pesticide products, whether they are shipped in interstate or intrastate commerce, is required under the new Act.

The reader is encouraged to consult the closest regional office of the Environmental Protection Agency for further information and details on the provisions and regulations of the Federal Environmental Pesticide Control Act of 1972.

### Recent EPA Actions

Cancellation proceedings were initiated under the FIFRA against aldrin, DDT, dieldrin, and mirex. After extensive public hearings, nearly all remaining registered uses of DDT were canceled in June 1972, the order to become effective December 31, 1972. This decision was based on potential future hazards to man and his environment.

The use of mirex against the imported fire ant in the Southeastern United States has been limited, primarily because of the hazard to aquatic life.

Cancellation of the use of 2,4,5-T on food crops has been continued, pending the outcome of a public hearing on possible risk of injury resulting from its application.

In June 1972, cancellation of most of the major registered uses of aldrin and dieldrin on corn, fruit, and for seed treatments was continued pending the conclusion of a public hearing and a final decision of EPA on possible use restrictions.

Suspension and cancellation notices for mercury-bearing pesticides were issued. Used heavily by industry, mercury builds up in the food chain and persists in the environment.

All interstate shipments of pesticides registered for use in the control of predatory animals were halted. This action was taken following the discovery that their use was destroying valuable wildlife resources including some endangered species.

## PRECAUTIONS

Pesticides used improperly can be injurious to man, animals, and plants. Follow the directions and heed all precautions on the labels.

Store pesticides in original containers under lock and key - out of the reach of children and animals—and away from food and feed.

Apply pesticides so that they do not endanger humans, livestock, crops, beneficial insects, fish, and wildlife. Do not apply pesticides when there is danger of drift, when honey bees or other pollinating insects are visiting plants, or in ways that may contaminate water or leave illegal residues.

Avoid prolonged inhalation of pesticide sprays or dusts; wear protective clothing and equipment if specified on the container.

If your hands become contaminated with a pesticide, do not eat or drink until you have washed. In case a pesticide is swallowed or gets in the eyes, follow the first aid treatment given on the label, and get prompt medical attention. If a pesticide is spilled on your skin or clothing, remove clothing immediately and wash skin thoroughly.

Do not clean spray equipment or dump excess spray material near ponds, streams, or wells. Because it is difficult to remove all traces of herbicides from equipment, do not use the same equipment for insecticides or fungicides that you use for herbicides.

Dispose of empty pesticide containers promptly. Have them buried at a sanitary land-fill dump, or crush and bury them in a level, isolated place.

NOTE: Some States have restrictions on the use of certain pesticides. Check your State and local regulations. Also, because registrations of pesticides are under constant review by the Environmental Protection Agency, consult your county agricultural agent or State extension specialist to be sure the intended use is still registered.

## EXPLANATION OF TABLES AND TERMINOLOGY IN PLANT DISEASE AND NEMATODE SECTIONS

This handbook has two sections of tables. One lists suggested fungicides for the major plant diseases and includes seed treatments. The second contains suggested nematicides to control nematode pests of crop plants, including ornamentals and turf. All chemicals suggested for use are registered for such use by the Environmental Protection Agency. The tables in each section contain a number of terms relating to safety levels and legal tolerances for pesticide residues permitted on food, feed and fiber products; the minimum time that must be allowed from last application of the suggested dosages to harvest or feeding in order to meet these tolerances; pesticide formulations; suggested dosages; and brief instructions on where and when to apply these chemicals.

Explanations of table headings and several definitions will allow the reader to make the fullest use of the information. *Tolerance* is that numerical amount of pesticide and/or its active fractions on or in an agricultural commodity that has been established as safe for human consumption. Tolerances may be shown as *ppm* or parts per million by weight of the various commodities. A chemical may be considered as *safe* for use if it is found in or on raw agricultural commodities in amounts within the limits of the stated tolerance or if its use on the specific commodity has been declared exempt from a tolerance. (These conditions meet the requirements of Section 408 of the Federal Food, Drug, and Cosmetic Act.) A pesticide may be classified as *exempt* on the basis of sufficient toxicological information, based on laboratory animal feeding tests, which indicates that it does not require a numerical tolerance. A *nonfood use* classification means a use which does not result in a residue on food. The term *extended* applied to a pesticide indicates that tolerances have not yet been set for the pesticide and that the supplier has been given an extra period of time to produce such information. *NTL* is the abbreviation for "No Time Limit."

Other safety information, precautions, or restrictions on the specific use of certain fungicides and nematicides are given in the last column. Always read

these precautions or restrictions to see if any of them apply to the pesticide that you plan to use and then observe those that are appropriate. For general precautions in the use of fungicides and nematicides, see the data on page 1.3.

With a few exceptions, the crops and pesticides are listed alphabetically within crop groups. The Fungicide Index, pp. 2.2.1 to 2.2.8, and the Nematicide Index, pp. 3.2.2 to 3.2.5, identify the pesticides suggested for use in this handbook. When two or more pesticides are listed for the control of a disease or a nematode, they are alternative pesticides and are to be used separately unless mixtures of two or more materials are indicated—usually by plus (+) signs. A single entry in a box applies to all the pesticides and formulations opposite that box, except as specified. A dash or a blank in any column indicates that there is no appropriate entry.

"Formulation" refers to the form of the pesticide, usually as purchased. These materials, with the abbreviations used for them in this guide, are as follows:

D	Dust	LC	Liquid Concentrate
EC	Emulsifiable Concentrate	P	Pellet
FS	Flowable Suspension	SL	Slurry
G	Granules	VL	Volatile Liquid
L	Liquid	WP	Wettable Powder

The pesticide dosages given in this handbook usually include the maximums suggested for plant disease and nematode control. Often dosages can be reduced without loss in effectiveness. Effective dosages can also be reduced by careful attention to application techniques or by the use of highly efficient well-maintained equipment under favorable weather conditions. Dosages suggested on the registered label should not be exceeded, to avoid leaving illegal residues on the harvested product.

Toxicity data are tabulated for fungicides and appear on page 2.2.9 and for nematicides in two tables on page 3.2.6. The LD<sub>50</sub> value is a statistical estimate of the dosage necessary to kill 50 percent of a population of white rats or other test animals within a standard time period under standard laboratory conditions. An acute LD<sub>50</sub> value indicates toxicity resulting from a single exposure. Acute oral (AO) values indicate introduction of the chemicals into the animal's esophagus or stomach; acute dermal (AD) values indicate placement of the chemicals directly on the skin. The numerical value is the amount of toxicant, in milligrams (mg), in relation to total weight in kilograms (kg) of the exposed animals. Acute vapor values shown for several of the fumigant nematicides are those concentrations, in parts per million

(ppm), that are probably not dangerous to human life for 60 minutes. Chronic vapor values are those concentrations, in ppm, that are at the human threshold of toxic exposure for 5 days a week, 8 hours a day. The toxicity of a chemical to laboratory animals may vary, however, with species, age, sex, and nutritional state, and with the formulation of the pesticide and the manner of administration. Also, the acute LD<sub>50</sub> value may provide little or no information on possible cumulative effects of repeated dosages of a chemical.

Trade names are used in this handbook solely for the purpose of providing specific information. Mention of a trade name does not constitute a guarantee or warranty of the product by the U.S. Department of Agriculture.

## METRIC SYSTEM EQUIVALENTS

A list of metric equivalents for weight, volume, and area units, and linear dimensions used in all of the tables are as follows:

### *Length*

Centimeter	= 0.3937 inch
Meter	= 3.23 feet
Kilometer	= 0.621 statute mile
Kilometer	= 0.5396 nautical mile
Inch	= 2.540 centimeters (or 1000 mils)
Foot	= 30.48 centimeters
Yard	= 0.914 meter
Rod (16.5 feet)	= 5.029 meters
Statute mile (1,760 yards)	= 1.61 kilometers

### *Area*

Hectare	= 2.471 acres
Acre (43,560 square feet)	= 0.405 hectare

### *Volume*

Liter	= 1.05 quarts, U.S.
Quart, liquid, U.S. (32 ounce)	= 0.946 liter
Quart, imperial (40 ounce)	= 1.136 liters
Gallon, U.S. (4 quarts)	= 3.785 liters
Gallon, imperial	= 4.546 liters

### *Weight*

Gram	= 0.035 Avoirdupois ounces
Kilogram	= 2.205 Avoirdupois pounds
Metric ton	= 0.984 gross or long ton
Metric ton	= 1.102 short or net tons

### *Avoirdupois pound (16 ounces)*

Avoirdupois ounce	= 0.4536 kilogram
Ounce (British Fluid)	= 28.35 grams
Ounce (U.S. Fluid)	= 28.41 ml
Gross or long ton (2240 pounds)	= 29.57 ml
Short or net ton (2000 pounds)	= 1.016 metric tons
	= 0.907 metric ton

### *Other conversions*

Square inch	= 6.45 square centimeters
Pound per square inch	= 70.31 grams per square centimeter
30 pounds per square inch	= 2.11 kilograms per square centimeter
Pound per acre	= 1.12 kilograms per hectare
Gallon per acre	= 9.35 liters per hectare
Pound per gallon	= 0.12 kilograms per liter
Foot candle	= 10.764 lux

## INTRODUCTION TO PLANT DISEASE SECTION, FUNGICIDE INDEX, AND TOXICITY TABLE

The Disease Section of this handbook is divided into three parts: Fungicide Index, with acute oral LD<sub>50</sub> toxicity values for most of the fungicides that are mentioned in the handbook; seed treatment lists of 9 fungicides in general use as seed treatment chemicals for the control of plant diseases; and tables of major crop diseases and suggested fungicides for their control.

The Fungicide Index is a list of registered chemicals referred to in the disease section of this handbook. The fungicides underlined in the left-hand

column are the names that are used in the tables. An ® after a name indicates a registered trade name. Approved common names are used when available and are lower case. The chemical name is given for each fungicide and the index is cross-referenced to indicate additional trade names or other designations.

Acute oral (AO) LD<sub>50</sub> toxicity values are given for most of the fungicides named in the index. Data in this list are from manufacturers' technical data sheets and from "Pesticide Manual," 2d Edition, Hubert Martin, Editor. 1971. British Crop Protection Council.



# FUNGICIDE INDEX

Name of Material <sup>1</sup>	Chemical Name (and additional designations)
AC 5223 -----	see dodine
Acti-dione® -----	see cycloheximide
Agri-mycin® 17 -----	see streptomycin
Agri-Strep® -----	see streptomycin
Allisan® -----	see DCNA
<u>anilazine</u> -----	2,4-dichloro-6-(o-chloroanilino)-s- triazine (Dyrene®, B-622)
Anticarie -----	see hexachlorobenzene
Arasan® -----	see thiram
B-622 -----	see anilazine
<u>Bay 22555</u> -----	sodium p-(dimethylamino)benzenediazo- sulfonate (Dexon®)
<u>Bay 36205</u> -----	6-methyl-2,3-quinoxalinedithio cyclic S,S-dithiocarbonate (Morestan®, quinomethionate, chinomethionat)
Bed Fume® -----	see MBR
Benlate® -----	see benomyl
<u>benomyl</u> -----	methyl 1-(butylcarbamoyl)-2- benzimidazolecarbamate (Benlate®, Fungicide 1991)

<sup>1</sup>See footnote at end of Index.

Name of Material <sup>1</sup>	Chemical Name (and additional designations)
<u>biphenyl</u> -----	biphenyl
blue stone -----	see copper sulfate
<u>borax</u> -----	sodium tetraborate decahydrate
<u>bordeaux mixture</u> -----	mixture of copper sulfate solution with suspension of calcium hydroxide
Botran® -----	see DCNA
Bravo W-75® -----	see chlorothalonil
Brom-O-Gas® -----	see MBR
Busan 72 -----	see TCMTB
Caddy -----	see cadmium chloride
Cadminate® -----	see cadmium succinate
<u>cadmium chloride</u> -----	cadmium chloride (Caddy)
<u>cadmium sebacate, potassium chromate, malachite green, auramine, thiram</u> -----	cadmium sebacate 5.0%, potassium chromate 5.0%, malachite green 1.0%, auramine 0.5%, thiram 16% (total cadmium 1.6%, total chromium 1.3%) (Kromad®)
<u>cadmium succinate</u> -----	cadmium succinate (Cadminate®)
<u>calcium cyanamide</u> -----	calcium cyanamide

<sup>1</sup>See footnote at end of Index.

Name of Material <sup>1</sup>	Chemical Name (and additional designations)
<u>calcium hypochlorite</u> -----	calcium hypochlorite
<u>captafol</u> -----	cis-N-[(1,1,2,2-tetrachloroethyl)thio]-4-cyclohexene-1,2-dicarboximide (Difolatan®)
<u>captan</u> -----	N-[(trichloromethyl)thio]-4-cyclohexene-1,2-dicarboximide (Orthocide®)
<u>carboxin</u> -----	5,6-dihydro-2-methyl-1,4-oxathiin-3-carboxanilide (Vitavax®, D 735)
Chem-Vape® -----	see SMDC
chinomethionat -----	see Bay 36205
Chinosol® -----	see 8-quinolinol sulfate
<u>chloranil</u> -----	tetrachloro-p-benzoquinone (Spergon®)
<u>chloroneb</u> -----	1,4-dichloro-2,5-dimethoxybenzene (Demosan®, Soil Fungicide 1823)
<u>chloropicrin</u> -----	trichloronitromethane (Larvacide®, Picfume®)
<u>chlorothalonil</u> -----	tetrachloroisophthalonitrile (Bravo W-75®, Daconil 2787®, DAC 2787, Termil®)
Citcop 4E -----	see copper salts of fatty and rosin acids

<sup>1</sup>See footnote at end of Index.

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## 2.2.2

Name of Material <sup>1</sup>	Chemical Name (and additional designations)
COCS -----	see copper oxychloride sulfate
<u>copper carbonate</u> -----	copper carbonate (malachite)
copper, fixed -----	see fixed copper
<u>copper hydroxide</u> -----	cupric hydroxide (Kocide 101)
<u>copper oxychloride sulfate</u> -----	basic copper sulfate and chlorides (COCS)
<u>copper salts of fatty and rosin acids</u> -----	copper salts of fatty and rosin acids (Citcop 4E)
<u>copper sulfate</u> -----	copper sulfate, pentahydrate (blue stone)
copper sulfate (basic) -----	see fixed copper
<u>copper sulfate (monohydrate) + excess of hydrated lime</u> -----	forms bordeaux mixture in presence of moisture on plant surface
<u>copper-zinc-chromate complex</u> -----	copper-zinc-chromate complex (28% Cu) (Miller-658)
CR-1639 -----	see dinocap
Crag fungicide 974 -----	see DMTT
Crag® Glyodin -----	see glyodin
<u>cycloheximide</u> -----	3-[2-(3,5-dimethyl-2-oxocyclohexyl)-2-hydroxyethyl]-glutarimide (Acti-dione®)

<sup>1</sup>See footnote at end of Index.

Use Pesticides Safely—Follow the Label

Name of Material <sup>1</sup>	Chemical Name (and additional designations)
Cyprex®-----	see dodine
<u>2,4-D</u> -----	(2,4-dichlorophenoxy)acetic acid (Weedone 638)
D 735-----	see carboxin
DAC 2787-----	see chlorothalonil
Daconil 2787®-----	see chlorothalonil
dazomet-----	see DMTT
<u>DCNA</u> -----	2,6-dichloro-4-nitroaniline (Botran®, Allisan®, U-2069, RD6584, dicloran)
<u>DD-MENCS</u> -----	1 : 1 mixture of 1,2-dichloropropane and 1,3-dichloropropene and related chlorinated C <sub>3</sub> hydrocarbons (80%) + methyl isothiocyanate (20%) (Vorlex®)
Demosan®-----	see chloroneb
Dexon®-----	see Bay 22555
<u>dichlone</u> -----	2,3-dichloro-1,4-naphthoquinone (Phygon®)
dicloran-----	see DCNA
Difolatan®-----	see captafol

<sup>1</sup>See footnote at end of Index.

Name of Material <sup>1</sup>	Chemical Name (and additional designations)
<u>dinocap</u> -----	mixture of 2-(1-methylheptyl)- 4,6-dinitrophenol and 2-(1-methyl- heptyl)-4,6-dinitrophenyl crotonate + isomers (Karathane®, CR-1639)
diphenyl-----	see biphenyl
<u>diphenylamine</u> -----	diphenylamine (DPA)
Dithane® M-22-----	see maneb
Dithane® M-45-----	see zinc ion-maneb complex
Dithane® S-31-----	see nickel sulfate-maneb
Dithane® Z-78-----	see zineb
<u>DMTT</u> -----	3,5-dimethyl-1,3,5,2H- tetrahydrothiadiazine-2-thione (Mylone®, Crag fungicide 974, N-521, dazomet)
<u>dodine</u> -----	<u>n</u> -dodecylguanidine acetate (Cyprex®, Melprex®, AC 5223)
Dowicide® 1-----	see OPP
Dowicide® G-----	see sodium pentachlorophenate
DPA-----	see diphenylamine

<sup>1</sup>See footnote at end of Index.

Name of Material <sup>1</sup>	Chemical Name (and additional designations)
Du-Ter®-----	see TPTH
Dyrene®-----	see anilazine
<u>ethoxyquin</u> -----	6-ethoxy-1,2-dihydro-2,2,4-trimethylquinoline (Stop Scald®)
<u>ETMT</u> -----	5-ethoxy-3-(trichloromethyl)-1,2,4-thiadiazole (Koban, OM 2424, Terraclor® Super X (in part), Terrazole®, Truban)
fentin hydroxide-----	see TPTH
<u>ferbam</u> -----	ferric dimethyldithiocarbamate (Fermate®, Karbam® Black, Naco Hi-Test ferbam)
Fermate®-----	see ferbam
<u>fixed copper</u> -----	includes the basic sulfates, oxychlorides and oxides
<u>folpet</u> -----	N-[(trichloromethyl)thio]-phthalimide (Phaltan®)
<u>folpet-cadmium carbonate-thiram</u> -----	folpet 60%, cadmium carbonate 5%, thiram 10% (Ortho® Lawn and Turf Fungicide)
Fore®-----	see zinc ion-maneb complex
<u>formaldehyde</u> -----	formaldehyde (methanal, formalin)

Name of Material <sup>1</sup>	Chemical Name (and additional designations)
formalin-----	see formaldehyde
Fungicide 1991-----	see benomyl
<u>glyodin</u> -----	2-heptadecyl-2-imidazole acetate (Crag® Glyodin)
HCB-----	see hexachlorobenzene
<u>hexachlorobenzene</u> -----	hexachlorobenzene (Anticarie, HCB, No Bunt 40, No Bunt Liquid, perchlorobenzene)
<u>hydroxyquinoline benzoate</u> -----	8-quinolinol benzoate (8-hydroxyquinoline benzoate, oxyquinoline benzoate)
8-hydroxyquinoline benzoate-----	see hydroxyquinolin benzoate
8-hydroxyquinoline sulfate-----	see 8-quinolinol sulfate
Karathane®-----	see dinocap
Karbam® Black-----	see ferbam
Koban-----	see ETMT
Kocide 101-----	see copper hydroxide
Kromad®-----	see cadmium sebacate, potassium chromate, malachite green, auramine, thiram
Lanstan®-----	see NIA 5961

<sup>1</sup>See footnote at end of Index.

<sup>1</sup>See footnote at end of Index.

Name of Material <sup>1</sup>	Chemical Name (and additional designations)
Larvacide®-----	see chloropicrin
<u>lime-sulfur</u> -----	30% calcium polysulfide and various small amounts of calcium thiosulfate plus water and free sulfur
malachite -----	see copper carbonate
mancozeb -----	see zinc ion-maneb complex
<u>maneb</u> -----	manganous ethylenebis [dithiocarbamate] (Dithane® M-22, Manzate®, MEB)
Manzate®-----	see maneb
Manzate® 200 -----	see zinc ion-maneb complex
<u>MBR</u> -----	monobromomethane or methyl bromide (Bed Fume®, Brom-O-Gas®, Meth-O-Gas®, Panobrome®, Pestmaster®, Weedfume®)
<u>MBR-CP</u> -----	methyl bromide (98%) + chloropicrin (2%)
MEB-----	see maneb
Melprex®-----	see dodine
Mertect®-----	see thiabendazole
metam -----	see SMDC
metham sodium -----	see SMDC

<sup>1</sup>See footnote at end of Index.

Name of Material <sup>1</sup>	Chemical Name (and additional designations)
methanal -----	see formaldehyde
Meth-O-Gas®-----	see MBR
Miller-658 -----	see copper-zinc-chromate complex
Morestan®-----	see Bay 36205
Mycoban®-----	see SMDC
Mylone®-----	see DMTT
N-521-----	see DMTT
<u>nabam</u> -----	disodium ethylenebis(dithiocarbamate) (Spring-Bak®)
<u>nabam + zinc sulfate</u> -----	tank mix preparations by reactions of zinc sulfate and disodium ethylenebis(dithiocarbamate) to form zineb
Naco Hi-Test ferbam -----	see ferbam
<u>NIA 5961</u> -----	1-chloro-2-nitropropane (Lanstan®)
<u>NIA 9102</u> -----	mixture of 5.2 parts by weight of ammoniates of [ethylenebis (dithiocarbamate)]zinc with 1 part by weight ethylenebis[dithiocarbamic acid], bimolecular and trimolecular cyclic anhydrosulfides and disulfides (Polyram®)

<sup>1</sup>See footnote at end of Index.

Name of Material <sup>1</sup>	Chemical Name (and additional designations)
Niagara Z-C® Spray	-----see ziram
<u>nickel sulfate-maneb</u>	-----mixture of nickel sulfate and manganous ethylenebis[dithio- carbamate] (Dithane® S-31)
No Bunt 40	-----see hexachlorobenzene
No Bunt Liquid	-----see hexachlorobenzene
OM 2424	-----see ETMT
<u>OPP</u>	-----o-phenylphenol (Dowicide® 1)
Orthocide®	-----see captan
Ortho® Lawn and Turf Fungicide	-----see folpet-cadmium carbonate- thiram
oxine sulfate	-----see 8-quinolinol sulfate
oxyquinoline benzoate	-----see hydroxyquinoline benzoate
Panobrome®	-----see MBR
<u>paraformaldehyde</u>	-----paraformaldehyde (polymerized formaldehyde, trioxymethylene)
Parzate® C	-----see zineb
Parzate® D	-----see zineb
<u>PCNB</u>	-----pentachloronitrobenzene (Terrachlor®, Terraclor®, Terraclor® Super X (in part), quintozene)

<sup>1</sup>See footnote at end of Index.

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Name of Material <sup>1</sup>	Chemical Name (and additional designations)
<u>PCNB-ETMT</u>	-----pentachloronitrobenzene + 5- ethoxy-3-(trichloromethyl)-1,2,4- thiadiazole (Terraclor® Super X)
perchlorobenzene	-----see hexachlorobenzene
Pestmaster®	-----see MBR
Phaltan®	-----see folpet
Phygon®	-----see dichlone
Picfume®	-----see chloropicrin
polymerized formaldehyde	-----see paraformaldehyde
Polynam®	-----see NIA 9102
<u>8-quinolinol sulfate</u>	-----8-quinolinol sulfate (Chinosol®, oxine sulfate, Quinosol®, 8- hydroxyquinoline sulfate)
quinomethionate	-----see Bay 36205
Quinosol®	-----see 8-quinolinol sulfate
quintozene	-----see PCNB
RD6584	-----see DCNA
Santobrite	-----see sodium pentachlorophenate
<u>SMDC</u>	-----sodium N-methyldithiocarbamate (Chem-Vape®, metam, metham sodium, Mycoban®, Vapam®, VPM, Trimaton®)

<sup>1</sup>See footnote at end of Index.

Use Pesticides Safely--Follow the Label



Name of Material <sup>1</sup>	Chemical Name (and additional designations)
<u>sodium pentachlorophenate</u> -----	sodium pentachlorophenate (Dowicide® G, Santobrite)
Soil Fungicide 1823-----	see chloroneb
<u>SOPP</u> -----	sodium <u>o</u> -phenylphenate
Spergon®-----	see chloranil
Spotrete-----	see thiram
Spring-Bak®-----	see nabam
Stop Scald®-----	see ethoxyquin
<u>streptomycin</u> -----	2,4-diguanidino-3,5,6- trihydroxycyclohexyl 5-deoxy- 2- <u>O</u> -(2-deoxy-2-methylamino- <u>a</u> - glucopyranosyl)-3-formyl pentanofuranoside (Agri-mycin® 17, Agri-Strep®)
<u>sulfur</u> -----	sulfur
<u>TCMTB</u> -----	2-[(thiocyanomethyl)thio] benzothiazole (Busan 72)
Tecto®-----	see thiabendazole
Termil®-----	see chlorothalonil
Terrachlor®-----	see PCNB
Terraclor®-----	see PCNB
Terraclor® Super X -----	see PCNB-ETMT

<sup>1</sup>See footnote at end of Index.

Name of Material <sup>1</sup>	Chemical Name (and additional designations)
Terrazole®-----	see ETMT
Tersan®-----	see thiram
<u>thiabendazole</u> -----	2-(4-thiazolyl)-benzimidazole (Mertect®, Tecto®)
<u>thiram</u> -----	bis(dimethylthiocarbamoyl) disulfide (Arasan®, Spotrete, Tersan®, Thiramad®, Thylate®, TMTD, TMTDS)
Thiramad®-----	see thiram
Thylate®-----	see thiram
TMTD-----	see thiram
TMTDS-----	see thiram
<u>TPTH</u> -----	triphenyltin hydroxide (Du-Ter®, fentin hydroxide)
Trimaton®-----	see SMDC
trioxymethylene-----	see paraformaldehyde
Truban-----	see ETMT
U-2069-----	see DCNA
Vapam®-----	see SMDC
Vitavax®-----	see carboxin
Vorlex®-----	see DD-MENCS

<sup>1</sup>See footnote at end of Index.

Name of Material <sup>1</sup>	Chemical Name (and additional designations)
VPM -----	see SMDC
Weedfume®-----	see MBR
Weedone 638-----	see 2,4-D
Zerlate®-----	see ziram
<u>zinc ion-maneb complex</u> -----	coordination product of zinc ion and manganous ethylenebis [dithiocarbamate] (Dithane® M-45, Fore®, Manzate® 200, mancozeb)
<u>zinc sulfate</u> -----	zinc sulfate
<u>zineb</u> -----	zinc ethylenebis[dithiocarbamate] (Dithane® Z-78, Parzate® C, Parzate® D)
<u>ziram</u> -----	zinc dimethyldithiocarbamate (Niagara Z-C® Spray, Zerlate®)

<sup>1</sup>An ® after the name indicates a registered trade name. Common names are used when available and are usually lower case. When more than one name is given, the name underscored is the name used in this Guide.

**Use Pesticides Safely—Follow the Label**

## TOXICITY TABLE

Acute oral LD<sub>50</sub> values of fungicides for test animals

Fungicide	AO LD <sub>50</sub> <sup>1</sup>
anilazine	2,710
Bay 22555	60
Bay 36205	3,000
benomyl	>9,590 <sup>2</sup>
biphenyl	3,280
borax	2,660-5,140
bordeaux mixture	300
cadmium chloride	88
cadmium succinate	660
calcium cyanamide	1,400
calcium hypochlorite	(rb) chlorine LC 0.4-0.9
captafol	5,000-6,200
captan	9,000
carboxin	3,200
chloranil	4,000
chloroneb	>11,000
chloropicrin	0.8 mg/l <sup>3</sup>
chlorothalonil	>10,000
cycloheximide	2.5
2,4-D	375
DCNA	4,040 - >10,000
DD	140
DD-MENCS	
(MENCS fraction only)	100
dichlone	1,300
dinocap	980-1,190
diphenylamine	>2,500
DMTT	500
dodine	1,000-2,000
ETMT	2,000
ferbam	>17,000
folpet	>10,000
formaldehyde	800
glyodin	3,720
hexachlorobenzene	10,000
hydroxyquinoline benzoate	1,200
maneb	6,750
nabam	395

See footnote at end of table.

Acute oral LD<sub>50</sub> values of fungicides for test animals—continued

Fungicide	AO LD <sub>50</sub> <sup>1</sup>
NIA 5961	197 ± 20
NIA 9102	>10,000
nickel sulfate-maneb	2,780
OPP	2,400
paraformaldehyde	>1,600
PCNB	>12,000
8-quinolinol sulfate	1,200
SMDC	820, (m) 285
sodium pentachlorophenate	210
SOPP	2,480
streptomycin	(m) 9,000
TCMTB	1,590
thiabendazole	3,330
thiram	375-865
TPTH	108-209
zinc ion-maneb complex	>8,000
zineb	>5,200
ziram	1,400

<sup>1</sup> Acute oral (AO) levels expressed as LD<sub>50</sub> values for white rats except for rabbit (rb) and white mouse (m).

<sup>2</sup> This is approximate lethal dose.

<sup>3</sup> This is lethal dose for 30-minute exposure.

## **TABLES OF MAJOR CROP DISEASES AND SUGGESTED FUNGICIDES FOR THEIR CONTROL**

The fungicides suggested for control of the various diseases are those that have, through general usage, been found to provide adequate to excellent control when used in accordance with the recommendations made by local or regional plant pathologists. In several instances, the suggested chemicals are intended to be used for the control of bacterial diseases. The chemicals suggested for control of a particular disease are not listed in order of priority, nor is the list necessarily exhaustive. All chemicals suggested for use are registered for such use by the Environmental Protection Agency. Only

diseases that are considered to be of major economic importance are given in the tables. In most cases, these diseases have been identified not only by common name, such as “wilt,” “rot,” and “leaf spot,” but also by the scientific name of the agent causing the disease. We feel that such specific identification will help to clarify some of the confusion that has existed in the past because of the use of purely descriptive but otherwise meaningless terms, such as “wilt,” “rot,” and “leaf spot.” The tables are arranged by crops in the following order: Field Crop Diseases, Flower and Ornamental Diseases, Forest Tree Diseases, Fruit Diseases, Fruit and Vegetable Postharvest Diseases, Grass Seed Crop Diseases, Oilseed and Industrial Crop Diseases, Shade Tree Diseases, Tree-Nut Diseases, Turfgrass Diseases, and Vegetable Diseases.

**FIELD CROP DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
<b>BARLEY</b>							
Covered smut ( <u>Ustilago hordei</u> )	formaldehyde	Nonfood use	--*	L	1 lb./pt. water for 50 bu. or 1 pt./30-40 gal. water	Seed dip or sprinkle and mix seed. Cover 4 hours.	Seed treatment only. Do not use treated seed for food, feed, or oil purposes.
	maneb	Nonfood use	--*	D	0.75-2 oz./bu.	Apply dry or as a slurry and mix thoroughly with seed.	Seed treatment only. Do not use treated seed for food, feed, or oil purposes.
	paraformaldehyde	Nonfood use	--*	D	0.18 oz./bu.	Mix with seed and wait 15 hours before planting.	Seed treatment only. Do not use treated seed for food, feed, or oil purposes.
	thiram	Nonfood use	--*	D or SL	2 oz./100 lb.	Apply dry or as a slurry and mix thoroughly with seed.	Seed treatment only. Do not use treated seed for food, feed, or oil purposes.
Black loose smut ( <u>Ustilago nigra</u> )	formaldehyde	Nonfood use	--*	L	1 lb./pt. water for 50 bu. or 1 pt./30-40 gal. water	Seed dip or sprinkle and mix seed. Cover 4 hours.	Seed treatment only. Do not use treated seed for food, feed, or oil purposes.
	maneb	Nonfood use	--*	D	0.75-2 oz./bu.	Apply dry or as a slurry and mix thoroughly with seed.	Seed treatment only. Do not use treated seed for food, feed, or oil purposes.
Loose smut ( <u>Ustilago nuda</u> )	carboxin	Nonfood use	--*	D, L, or SL	3 oz./100 lb.	Foundation and registered seed only.	Seed treatment only. Do not use treated crop, including hay, straw, and grain, as food or feed. Do not graze treated crop.

\* Does not apply.

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**FIELD CROP DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
<b>BARLEY</b>							
Helminthosporium leaf blights ( <i>H. teres</i> , net blotch; <i>H.</i> <i>sorokinianum</i> , spot blotch)	zinc ion-maneb complex	25 in or on straw 20 in feed 5 in or on grain	26	WP or D	1.6 lb./acre in water; repeat in 7-10 days	Apply to foliage, be- ginning at tillering; repeat at 7-10 day intervals.	Do not graze or har- vest for 26 days after last application.
Rust ( <i>Puccinia</i> spp.)	sulfur	Safe	--*	WP or D	25 to 40 lb./acre; repeat at 7-10 day intervals	Spray all plant parts.	Limit to 50 lb./acre.
Seed rots, damping-off, and seedling blights	captan	Nonfood use	--*	WP, D, or SL	SL: 0.6-1.9 oz. actual/100 lb. Dry: 0.6-2.0 oz. actual/ 100 lb. Planter box: 0.8-2.0 oz. actual/ 100 lb.	Apply dry or as a slurry and mix thoroughly with seed.	Seed treatment only. Do not use treated seed for food or feed.
	maneb	Nonfood use	--*	D	0.75-2 oz./bu.	Apply dry or as a slurry and mix thoroughly with seed.	Seed treatment only. Do not use treated seed for food or feed.
	thiram	Nonfood use	--*	D or SL	2 oz./100 lb.	Apply dry or as a slurry and mix thoroughly with seed.	Seed treatment only. Do not use treated seed for food or feed.
	zineb	Nonfood use	--*	WP or D	0.5 oz./bu. + captan	Apply dry or as a slurry and mix thoroughly with seed.	Seed treatment only. Do not use treated seed for food or feed.

\* Does not apply.

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FIELD CROP DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
<b>CORN (FIELD)</b>							
Helminthosporium leaf blights ( <u>H. maydis</u> , <u>H. turcicum</u> , and <u>H. carbonum</u> )	copper salts of fatty and rosin acids	Exempt	NTL		1/2 gal./acre	Foliar spray repeated in 5-10 days.	For <u>H. maydis</u> only. Use limited to North Central States.
	zinc ion-maneb complex	0.1 in or on grain 5.0 in or on fodder or forage	40	WP or D	1.2 lb./acre in sufficient water to cover thoroughly	Begin when disease first appears; repeat at 4-7 day intervals.	
	zineb	0.1 in or on grain 5.0 in or on fodder or forage	40	WP or L	3/acre	Foliar spray repeated in 5-10 days.	Do not feed treated forage to dairy animals or animals being finished for slaughter.
Seed rots and seedling blights, various causes	captan	Nonfood use	---*	SL or D	0.90-1.10 oz. actual/ 100 lb. SL; 1.0-1.2 oz. /100 lb. D		Seed treatment only. Do not use treated seed for food, feed, or oil purposes.
	thiram	Nonfood use	---*	WP or D	1.33-1.65 oz. actual/100 lb. SL; 1.5 oz./100 lb. D		Seed treatment only. Do not use treated seed for food, feed, or oil purposes.

\* Does not apply.

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## FIELD CROP DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
COTTON							
Seedborne seedling diseases ( <i>Glomerella gossypii</i> , <i>Xanthomonas malva-</i> <i>cearum</i> , and species of <i>Fusarium</i> , <i>Alter-</i> <i>naria</i> , <i>Aspergillus</i> , <i>Diplodia</i> , and <i>Thielaviopsis</i> )	Bay 22555	Nonfood use	---*	70% WP	1.4-2.1 oz. actual /100 lb.	Dosage depends upon whether fuzzy, reginned, or acid-delinted seed is used. See manufacturer's label.	Bay 22555 is used with other protectant fungicides or chloroneb. Seed treatment only. Do not use treated seed for food, feed or oil purposes.
	captan	Nonfood use	---*	Various	0.75 to 4.0 oz. actual/100 lb.	Dosage depends upon whether fuzzy, reginned, or acid-delinted seed is used. See manufac- turer's label.	Seed treatment only. Do not use treated seed for food, feed, or oil purposes.
	carboxin	0.2 in seed	---*	57% WP	6.0 oz. actual/100 lb.	Single dosage for all types of delinting. See manufacturer's label.	Carboxin may be used with other seed protectant fungicides. Seed treatment only. Do not use treated seed for food, feed, or oil purposes. Do not graze or feed livestock on hay grown from treated seed.
	chloroneb	0.1 in seed 2.0 in forage	---*	65% WP	6.5 oz. actual/100 lb.	Use only as a supplemental seed treat- ment to suitable standard seed protect- ants.	Seed treatment only. Do not use treated seed for food, feed, or oil purposes.
	ETMT	Nonfood use	---*	Various EC formulations	1.0 to 2.5 oz. actual as EC/100 lb.	Dosage depends upon whether fuzzy, reginned, or acid-delinted seed is used. See manufacturer's label.	ETMT is used with other protectant fungicides. Seed treatment only. Do not use treated seed for food, feed, or oil purposes.

Continued

\* Does not apply.

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## FIELD CROP DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
COTTON							
Seedborne seedling diseases ( <i>Glomerella gossypii</i> , <i>Xanthomonas malva-</i> <i>cearum</i> , and species of <i>Fusarium</i> , <i>Alter-</i> <i>naria</i> , <i>Aspergillus</i> , <i>Diplodia</i> , and <i>Thielaviopsis</i> ) (con.)	PCNB	Nonfood use	--*	Various EC and WP	4-6/100 lb.	Dosage depends upon whether fuzzy, reginned, or acid-delinted seed is used. See manufacturer's label.	Seed treatment only. PCNB is often used with other pro- tectant fungicides. Do not use treated seed for food, feed, or oil purposes.
	TCMTB	0.1	--*	60% EC	3.0 to 3.5 fl. oz. /100 lb.	Dosage depends upon whether fuzzy, reginned, or acid-delinted seed is used. See manufacturer's label.	Seed treatment only. Do not use treated seed for food, feed, or oil purposes.
	thiram	Nonfood use	--*	Various WP	1.89 to 3.0 oz. actual /100 lb.	Dosage depends upon whether fuzzy, reginned, or acid-delinted seed is used. See manufacturer's label.	Seed treatment only. Do not use treated seed for food, feed, or oil purposes.
Soilborne seedling diseases ( <i>Rhizoctonia solani</i> and species of <i>Pythium</i> , <i>Fusarium</i> , <i>Thielaviopsis</i> , <i>Alter-</i> <i>naria</i> , and <i>Aspergillus</i> )	captan and PCNB	captan: 2.0 PCNB: 0.1	--*	Various dusts in 1:1 ratio	1 lb. actual captan and 1 lb. actual PCNB/ 14,500 linear ft. of row	Apply in-furrow at planting time to soil that surrounds and covers seed.	Do not allow food animals to eat foliage or vines in or from treated fields. Do not feed gin waste to live- stock. Do not plant any root crop not registered for PCNB in rotation on PCNB-treated soil. Use with cottonseed pretreated with a suitable seed protectant fungicide.

Continued

\* Does not apply.

## FIELD CROP DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
COTTON							
Soilborne seedling diseases ( <u>Rhizoctonia solani</u> and species of <u>Pythium</u> , <u>Fusarium</u> , <u>Thielaviopsis</u> , <u>Alternaria</u> , and <u>Aspergillus</u> ) (con.)	carboxin	0.2 in seed	--*	75% WP	6.0 oz. actual/100 lb.	Single dosage for all types of delinting. See manufacturer's label.	Carboxin may be used with other seed protectant fungicides. Seed treatment only. Do not use treated seed for food, feed, or oil purposes. Do not graze or feed livestock on hay grown from treated seed.
	chloroneb	0.1 in seed 2.0 in forage	--*	65% WP, D, G	1-2 as 10% dust or granules, or 1.3-1.95 as WP in 10-20 gal. water/acre (12,000 to 12,400 linear ft. of row)	Apply in-furrow at planting time to soil that surrounds and covers seed.	Use only on cottonseed pretreated with a suitable standard seed protectant fungicide.
	NIA 5961	0.05 in seed	--*	Various EC and granules	1.0 to 2.0 lb. as EC or granules per 12,400 to 13,000 linear feet of row	Apply in-furrow at time of planting at bottom of furrow. Immediately sealing with a packing wheel is desirable.	Do not allow food animals to eat forage or vines in or from treated fields. May be used with PCNB. Use with cottonseed pretreated with a suitable seed protectant fungicide.
	PCNB-ETMT	PCNB: 0.1 ETMT: Extended	--*	Various EC, D, and G	0.25-0.37 lb. actual ETMT and 1.0 to 1.5 lb. PCNB; or 0.25 lb. and 1.5 lb. as D or G /12,400 linear ft. of row	Apply in-furrow at planting time to soil that surrounds and covers seed.	Do not graze dairy or meat animals in treated fields. Do not feed gin waste to livestock. Do not plant any root crop not registered for PCNB in rotation on PCNB-treated soil. Use with cottonseed pretreated with a suitable seed protectant fungicide.

\* Does not apply

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## FIELD CROP DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
COTTON							
Southwestern cotton rust ( <u>Puccinia</u> <u>cacabata</u> )	zinc ion-maneb complex	0.5	---*	80% WP	1.0-1.6 lb./acre in sufficient water for thorough coverage	Begin when rust first appears in area; repeat at 10-14 day intervals.	Southwestern States only. Do not apply after bolls open. Do not graze treated areas. Do not feed gin trash to livestock.
OATS							
Covered smut ( <u>Ustilago kollerii</u> ) and Loose smut ( <u>U. avenae</u> )	PCNB (alone or with 1/4 dosage ETMT)	Nonfood use	---*	SL or D	0.50-1.0 actual/bu.	Apply dry or as a slurry and mix thoroughly with seed.	Seed treatment only. Do not use treated seed for food or feed.
Seedling blights and seed rots	captan	Nonfood use	---*	SL  D  Planter box application	0.6-2.8 oz. actual/100 lb. 0.6-3.0 oz. actual/100 lb. 0.4-2.0 oz. actual/100 lb.	Apply dry or as a slurry and mix thoroughly with seed.	Seed treatment only. Do not use treated seed for food or feed.
	maneb	Nonfood use	---*	D, Machine application  Planter box application	0.75-2.0 oz. actual/bu.  0.75-2.1 oz. actual/bu.	Apply dry and mix thoroughly with seed.	Seed treatment only. Do not use treated seed for food or feed.

Continued

\* Does not apply.

## FIELD CROP DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
<b>OATS</b>							
Seedling blights and seed rots (con.)	zinc ion-maneb complex	Nonfood use	---*	SL or D	1.6 oz. actual/bu.	Apply dry or as a slurry and mix thoroughly with seed; in seed treater or planter box.	For all chemicals on this page:
	zineb	Nonfood use	---*	SL	0.47 oz. actual/bu.	Apply dry or as a slurry and mix thoroughly with seed.	Seed treatment only. Do not use treated seed for food or feed.
				D	0.53 oz. actual/bu.	Apply dry or as a slurry and mix thoroughly with seed.	
<b>RICE</b>							
Seedling blights and seed rots	captan	Nonfood use	---*	D or SL	0.9-37.5 oz. actual/ 100 lb. SL; 0.8-3.75 oz. actual/100 lb. dry	Apply before, during or after soaking seed in water.	
	chloranil	Nonfood use	---*	D or SL	1.9 oz. actual/100 lb. SL; 2.4 oz. actual/ 100 lb. dry	Apply before, during or after soaking seed in water.	
	copper-zinc- chromate complex	Nonfood use	---*	WP	7.2 oz. actual/100 lb. dry	Apply before, during or after soaking seed in water.	
	dichlone	Nonfood use	---*	D or SL	1 oz. actual/100 lb. SL or dry	Apply before, during or after soaking seed in water.	
	thiram	Nonfood use	---*	D or SL	1.55-3.3 oz. actual/ 100 lb. SL; 2.15 oz. actual/100 lb. dry	Apply before, during or after soaking seed in water.	
	zinc ion-maneb complex	Nonfood use	---*	D or SL	1.6-3.2 oz. actual/100 lb. SL; 1.6-3.2 oz. actual/100 lb. dry	Apply before, during or after soaking seed in water.	

\* Does not apply.

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## FIELD CROP DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
RYE							
Covered smut (bunt) ( <i>Tilletia caries</i> )	maneb	Nonfood use	--*	L, WP, or D	0.75 oz. actual/bu. 0.75 oz. to 1/bu.	In seed treater. In planter box.	Seed treatment only. Do not use treated seed for food, feed, or oil purposes.
Stem smut ( <i>Ustilago spengazzini</i> )	formaldehyde	Nonfood use	--*	L	1 lb./pt. water for 50 bu. or 1 pt./ 30-40 gal. water	Seed dip or sprinkle and mix seed. Cover 4 hours.	Seed treatment only. Do not use treated seed for food, feed, or oil purposes.
Leaf blights ( <i>Helminthosporium</i> spp.) and Leaf spot ( <i>Septoria</i> spp.)	zinc ion-maneb complex	25 in or on straw 20 in feed and bran 5 in or on grain 1 in flour	26	WP or D	1.6 lb./acre in water; repeat in 7-10 days.	Apply to foliage, beginning at tillering; repeat at 7-10 day intervals.	Do not graze or harvest for 26 days after last application.
Seed blights and seed rots	captan	Nonfood use	--*	WP, D, or SL	Slurry: 0.6 to 1.6 oz. actual/100 lb. Dry: 0.6 to 1.5 oz. actual/100 lb. Planter box: 1.07-2.14 oz. actual/100 lb. with maneb		Seed treatment only. Do not use treated seed for food, feed, or oil purposes.
	maneb	Nonfood use	--*	L, WP, or D	0.75 oz./bu. 0.75 oz. to 1/bu.	In seed treater. In planter box.	Seed treatment only. Do not use treated seed for food, feed, or oil purposes.
	thiram	Nonfood use	--*	L, WP, D, or SL	1.84 oz. actual/100 lb.		Seed treatment only. Do not use treated seed for food, feed, or oil purposes.

Continued

\* Does not apply.

## FIELD CROP DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
RYE							
Seed blights and seed rots (con.)	zinc ion-maneb complex	Nonfood use	---*	WP or D	1.6 oz. actual/bu.		For all chemicals on on this page:  Seed treatment only. Do not use treated seed for food, feed, or oil purposes.
SORGHUM (FIELD AND SWEET)							
Loose kernel smut ( <u>Sphacelotheca</u> <u>cruenta</u> ), Covered smut ( <u>S. sorghi</u> ), Seedling blights, seed rots, and head smut ( <u>S. reiliana</u> )	captan	Nonfood use	---*	D or SL	1.9-2.3 oz. actual/100 lb. SL; 2-3 oz. actual/ 100 lb. dry		
	chloranil	Nonfood use	---*	D or SL	1.9 oz. actual/100 lb. SL; 2.9 oz. actual/ 100 lb. dry		
	dichlone	Nonfood use	---*	D or SL	1 oz. actual/100 lb. SL or dry		
	thiram	Nonfood use	---*	D or SL	1.79 oz. actual/100 lb. SL; 1.34 oz. actual/ 100 lb. dry		

\* Does not apply.

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## FIELD CROP DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
SUGARBEET								
Leaf spot ( <i>Cercospora beticola</i> )	benomyl	0.2 ppm in or on roots	21	WP	--	0.188- 0.250 in sufficient water	Foliage application. Begin when disease appears; repeat at 14-21 day intervals. Ground application only.	Do not graze or feed treated tops to livestock.
	copper hydroxide	Exempt	NTL	WP	--	0.56-2.8. Add 2 qt. of suit- able spray oil/acre as a spreader- sticker	Foliage application. Begin when disease threatens; repeat at 10- 14 day intervals for 4- 5 applications as needed.	Harmful if swallowed.
	maneb	45 (tops)	14	WP or D	1.2-2.4 lb. in sufficient water	1.2	Foliage application. Begin when disease threatens; repeat at 7-10 day intervals for 3-5 applications.	Do not feed treated tops to livestock if more than 1.6 lb. active ingredient has been applied per acre.
	NIA 9102	Extended	--*	WP	1.2-2.4 lb. /100-150 gal./acre	--	Begin when disease first appears; repeat at 7-10 day intervals.	Do not feed treated tops to meat or dairy animals.
	thiabendazole	0.25 on beets (excluding tops) 3.5 in or on pulp for feed	21	WP	---	3-6 oz.	Foliage application. Begin when disease appears; repeat at 14-21 day intervals. By ground equipment use 25-125 gal. water/acre; by air, 3-10 gal. water/acre.	Do not graze or feed treated tops to livestock. Do not use treated tops for silage.
	TPTH	0.1	14	WP	--	1.9-4.75 oz.	Foliage application. Begin when disease appears; repeat at 10-14 day intervals. In ground applications use at least 15 gal. water/acre; by air, at least 5 gal. water/acre.	Do not graze or feed treated tops to livestock.

\* Does not apply.

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## FIELD CROP DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
SUGARBEET								
Seed decay and damping-off	Bay 22555	Nonfood use	---*	WP	--	1.4-4.2 oz. /100 lb.	Mix thoroughly with seed. In light soils, do not exceed 2.8 oz./100 lb.	Do not use treated seed for food or feed.
	ETMT	Nonfood use	---*	L	--	0.375- 0.750 oz. /100 lb.	Mix thoroughly with seed.	Do not use treated seed for food or feed.
	PCNB	Nonfood use	---*	WP or D	--	1.5-3.0 oz. /100 lb.	Mix thoroughly with seed.	Do not use treated seed for food or feed.
SUGARCANE								
Pineapple disease ( <u>Ceratocystis</u> <u>paradoxa</u> )	benomyl	Nonfood use	---*	WP	1/8 lb. actual 1/4 lb. actual	--	Apply as 20-30 min. dip at 5-52° C. Apply as dip to cuttings, thoroughly wetting.	Seed piece treatment only.
Pythium root rot ( <u>Pythium</u> spp.)	Bay 22555	Extended	---*	G	0.052- 0.056 oz./ gal./8 sq. ft. bed area	--	Apply at weekly intervals for 8-12 weeks.	In propagation seed- beds only.
SWEET SORGHUM								

(See Sorghum)

\* Does not apply.

Use Pesticides Safely—Follow the Label

**FIELD CROP DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS •OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
<b>TOBACCO</b>								
Blue mold ( <u>Peronospora</u> <u>tabacina</u> ), Anthracnose ( <u>Colletotrichum</u> <u>destructivum</u> ), and Damping-off	ferbam	Nonfood use	---*	WP	2.3-3.0	--	Use 3 gal. of suspension/ 100 sq. yd. of bed when plants are small, increasing to 6 gal. as plants become larger; or use 0.1-0.4 lb. as a dust per 100 sq. yd. Begin dusting or spray- ing when leaves are size of a dime or when disease is first reported in the area.	Seed bed treatment only.
	maneb	Nonfood use	---*	WP or D	0.4-3.2  --	--  0.04-0.13 /100 sq. yd. of plant bed	Use 2.5-5 gal. of diluted suspension of WP or the dust/100 sq. yd. of bed. Begin when plants are the size of a dime or when blue mold is first reported in the area; repeat twice weekly until plants are set in field. Use lower rates in early applications, increasing to higher rates as plants increase in size.	Injury to plants may result at higher than recommended rates.
	NIA 9102	Nonfood use	---*	WP or D	1.2-1.6	Apply 3-6 gal./100 sq. yd. of plant bed or 0.07- 0.14 lb. as a dust/ 100 sq. yd.	Begin when plants are the size of a dime. One treatment is usually sufficient, but sprays can be repeated 2 or 3 times each week until transplanting without injuring plants.	

Continued

\* Does not apply.

## FIELD CROP DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
TOBACCO								
Blue mold ( <u>Peronospora</u> <u>tabacina</u> ), Anthracnose ( <u>Colletotrichum</u> <u>destructivum</u> ), and Damping-off (con.)	zineb	Nonfood use	--*	WP or D	1.125- 2.25	0.03-0.75 /100 sq. yd.	Plant bed. Use 3-6 gal. of suspension/100 sq. yd. of bed. Begin with lower rates when plants are the size of a dime, or when disease is first reported in the area; repeat at 3-4 day inter- vals until transplanting, increasing the rates as the plants increase in size.	
				D	--	2.4-3.25 or 2-8 (shade tobacco)	Field application. Begin soon after transplanting. Apply as necessary, usually about 1-3 times/ yr.	

\* Does not apply.

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Use Pesticides Safely—Follow the Label

## FIELD CROP DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
WHEAT							
Covered or Stinking smut (bunt) ( <i>Tilletia</i> <i>caries</i> and <i>T.</i> <i>foetida</i> )	copper carbonate	Exempt	---*	WP or D	0.4-0.8 oz. metallic copper equivalent/bu.	Apply as a dry mix.	For all chemicals on this page:
	copper sulfate	Exempt	---*	D	1-2 oz. metallic copper equivalent/bu.		Seed treatment only. Do not use treated seed for food, feed, or oil purposes.
	formaldehyde	Nonfood use	---*	L	1 lb./pt. water for 50 bu. or 1 pt./30-40 gal. water	Seed dip or sprinkle and mix seed. Cover 4 hours.	
	hexachlorobenzene	Nonfood use	---*	WP, D, or SL	0.2-42 oz./bu. as SL on seed, 0.2 as dust by machine, or 0.53 as dust with farm treater		
	maneb	Nonfood use	---*	D	0.75 oz./bu. 0.75 to 1.0 oz. actual/ bu.	In seed treater. In planter box.	
	PCNB	Nonfood use	---*	WP or D	0.75 oz./bu.		
	PCNB-ETMT	Nonfood use	---*	L	0.125 oz./bu.		
	thiram	Nonfood use	---*	WP, D, or SL	1.66 oz. actual/100 lb.		
Dwarf bunt ( <i>Tilletia caries</i> )	hexachlorobenzene	Nonfood use	---*	WP, D, or SL	0.2 oz. plus 1.0 oz. maneb, SL or dry/bu., or 1-2 oz. plus equal amounts of captan and maneb, for planter box.		
Flag smut ( <i>Urocystis tritici</i> or <i>U. agropyri</i> )	formaldehyde	Nonfood use	---*	L	1 lb./pt. water for 50 bu. or 1 pt./30-40 gal. water	Seed dip or sprinkle and mix seed. Cover 4 hours.	

Continued

\* Does not apply.

## FIELD CROP DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
WHEAT							
Flag smut ( <u>Urocystis tritici</u> or <u>U. agropyri</u> ) (con.)	hexachlorobenzene	Nonfood use	---*	WP, D, or SL	0.2 oz. plus 1.0 oz. maneb, SL or dry/ bu., or 1-2 oz. plus equal amounts of captan and maneb, for planter box.		Seed treatment only. Do not use treated seed for food, feed, or oil purposes.
Loose smut ( <u>Ustilago tritici</u> )	carboxin	Nonfood use	---*	D, L, or SL	3 oz. actual/100 lb. seed	Foundation and registered seed only.	Seed treatment only. Do not use treated crop, including hay, straw, and grain, as food or feed. Do not graze treated crop.
		0.2 in or on wheat grain and wheat straw	---*	D, L, or SL	1.5-2.25 oz. actual/ 100 lb. seed	Winter wheat only.	State of Washington only.
Stem and leaf rusts ( <u>Puccinia graminis</u> <u>tritici</u> and <u>P.</u> <u>recondita</u> )	sulfur	Safe	---*	WP or D	25 to 40 lb./acre	Apply to any part of plant; repeat in 7-10 days.	Limit 50 lb./acre.
	zineb	1	3-4 weeks	WP	1.125-1.5/100 gal.	Begin when plants are in boot or early heading stage, or when rust is first reported in the area; repeat at 7-10 day intervals until milk stage.	
Leaf blights, blotch and spot ( <u>Helminthosporium</u> and <u>Septoria</u> spp.) Continued	copper hydroxide	Nonfood use	---*	WP	0.81-1.08/acre	Begin at early heading stage; repeat 10 days later.	Do not use for food or feed.

\*Does not apply.



## FIELD CROP DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
WHEAT							
Leaf blights, blotch and spot ( <i>Helminthosporium</i> and <i>Septoria</i> spp.) (con.)	zinc ion-maneb complex	25 in or on straw 20 in feed and bran 5 in or on grain 1 in flour	26	WP or D	1.6 lb./acre in sufficient water.	Begin in tillering to jointing stages; repeat at 7-10 days intervals.	Do not make more than 3 applications/season. Do not graze or har- vest for 28 days after last applica- tion.
Seedling blights and seed rots	captan	Nonfood use	---*	WP, D, or SL	SL: 0.6-2.0 oz./100 lb. Dry: 0.6-1.5 oz./100 lb. Planter box: 0.4-2.0 oz./100 lb.		For the remainder of all chemicals on this page:  Seed treatment only. Do not use treated seed for food, feed, or oil purposes.
	maneb	Nonfood use	---*	D	0.7 oz./bu. 0.75 oz. to 1.0 oz./bu.	In seed treater. In planter box.	
	PCNB	Nonfood use	---*	WP or D	0.75 oz./bu.		
	PCNB-ETMT	Nonfood use	---*	L	0.125 oz./bu.		
	thiram	Nonfood use	---*	WP, D, or SL	1.66 oz./100 lb.		
	zinc ion-maneb complex	Nonfood use	---*	WP or D	1.6 oz./bu.		

\* Does not apply.

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**FLOWER AND ORNAMENTAL DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
<b>AFRICAN VIOLET</b>	dinocap			LC or D	1.92-3.84 oz. LC/ 100 gal., field; 1.92 oz., greenhouse	0.3-0.5 D	Begin when disease first appears; repeat at 10-day intervals as necessary.	
Powdery mildew ( <u>Oidium</u> sp.)								
Stem rot ( <u>Rhizoctonia</u> sp.)	PCNB			WP or D	65	65	Mix into top 2 inches of soil or use 82 lb./300 gal./acre as a soil drench before planting.	
<b>ASTER</b>	benomyl			WP	4 oz.	--	Begin when disease first appears; repeat at 10-14 day intervals as neces- sary, more frequently under severe disease conditions.	For Botrytis and powdery mildew only.
Botrytis flower blight and Stem rot ( <u>Botrytis cinerea</u> ), Rust ( <u>Coleosporium</u> <u>solidaginis</u> ), Downy mildew ( <u>Basidiophora</u> <u>endospora</u> ), and Powdery mildew ( <u>Erysiphe</u> <u>cichoracearum</u> )								
	zineb			WP or D	1.125-1.5	2.0-2.6	Begin when disease threatens or before disease appears; repeat at 7-10 day intervals, more frequently during periods of prolonged rainfall or high humidity.	

**FLOWER AND ORNAMENTAL DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
ASTER								
Leaf spots ( <u>Septoria</u> , <u>Ascochyta</u> , and <u>Stemphylium</u> spp.)	ferbam			WP or D	0.76-1.14	To cover	Begin after plants are well established and before diseases appear; repeat at 7-10 day inter- vals until bloom and after bloom as necessary.	
	zineb			WP or D	1.125-1.5	2-2.6	Begin when diseases threaten or before disease appears; repeat at 7-10 day intervals, more frequently during periods of prolonged rainfall or high humidity.	

Leaf spots, wilt

(See seed treatment list - zineb)

AZALEA AND  
RHODODENDRON

Petal blight  
(Ovulinia azaleae)

ferbam

WP or D

0.76-1.14

To cover

Begin after plants are  
well established and  
before disease appears.  
Apply at 3-4 day inter-  
vals during bloom to  
plants, flowers, and  
litter around plants.

Continued

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**FLOWER AND ORNAMENTAL DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
<b>AZALEA AND RHODODENDRON</b>  <b>Petal blight (<i>Ovulinia azaleae</i>) (con.)</b>	PCNB			WP, D, or EC	200-232	200-232 or 0.25 EC /10 gal. water/ 50 sq. ft.	Spray or dust ground under plants and the surrounding area. Begin 4 weeks before bloom; repeat at 3-4 week inter- vals during bloom.	
	thiram			WP	0.65	--	Begin when first blooms open; repeat at 5-10 day intervals through blooming period. Thoroughly wet plant surfaces including blossoms. Soak ground and litter around plants.	
	zinc ion-maneb complex			WP	1.2	--	Apply 2-3 times a week while flowers are opening. Direct spray into flowers and spray ground under bushes thoroughly.	
	zineb			WP or D	1.125-1.5	2-2.6	Apply 2-3 times a week while flowers are opening; spray flowers, soil, and litter around plants.	

**FLOWER AND ORNAMENTAL DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
BEGONIA								
Powdery mildew ( <i>Erysiphe</i> <i>cichoracearum</i> )	cycloheximide			--	5 ppm	--	Spray all leaf and stem surfaces. Begin when disease first appears; repeat at 3-7 day inter- vals.	
	dinocap			LC or D	1.92-3.84 oz. LC, field; 1.92 oz., greenhouse	0.3-0.5 D	Begin when disease first appears; repeat at 10-day intervals as necessary.	
Damping-off and Tuber rot ( <i>Pythium</i> spp. and <i>Rhizoctonia</i> spp.)	captan			WP	2	--	Dip tubers 30 minutes, drain, and plant.	For tuberose begonias.
CALENDULA								
Powdery mildew ( <i>Erysiphe</i> spp.)	benomyl			WP	4 oz.	--	Begin when disease first appears; repeat at 10- 14 day intervals as necessary, more frequently under severe disease conditions.	
	dinocap			LC or D	1.92-3.84 oz. LC, field; 1.92 oz., greenhouse	0.3-0.5 D	Begin when disease first appears; repeat at 10- day intervals as necessary.	

**FLOWER AND ORNAMENTAL DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
<b>CAMELLIA</b>								
<u>Petal blight (Sclerotinia camelliae)</u>	captan			WP	0.5	--	Apply to drench soil around plants, beginning when flowers start to open; repeat at 7-14 day intervals through bloom.	
	ferbam			WP or D	0.76-1.4	To cover	Apply as a monthly soil drench and to soil and litter around plants at 3-4 day intervals during bloom.	
	PCNB			WP or D	200 in sufficient water	200	Begin before buds open. Apply to soil and litter beneath bushes and to surrounding soil; repeat at 3-4 week intervals during blooming period.	
	zinc ion-maneb complex			WP	1.2	--	Apply 2-3 times a week while flowers are opening. Direct spray on ground under bushes thoroughly.	
	ziram			WP	1.4-1.52	--	Begin when flower buds start to swell; repeat at 7-10 day intervals. Apply as a drench to mulch and litter beneath and around bushes.	

FLOWER AND ORNAMENTAL DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
CARNATION								
<u>Alternaria blight</u> ( <u>Alternaria dianthi</u> )	captan			WP	1	--	Begin at first sign of disease; repeat at 7-10 day intervals. Shorten intervals during frequent rains and heavy dews.	
	ferbam			WP or D	0.76-1.14	Dust to cover	Begin after plants are well established and before disease appears; repeat at 7-10 day intervals until bloom and after bloom as necessary.	
	zineb			WP or D	1.125-1.5	2-2.6	Begin when disease threatens or before disease appears; repeat at 7-10 day intervals, more frequently during periods of prolonged rainfall or high humidity.	
<u>Rust</u> ( <u>Uromyces caryophyllinus</u> )	captan			WP	1	--	Begin at first sign of disease; repeat at 7-10 day intervals. Shorten intervals during periods of frequent rains or heavy dews.	
	ferbam			WP or D	0.76-1.14	Dust to cover	Begin after plants are well established and before disease appears; repeat at 7-10 day intervals until bloom and after bloom as necessary.	

**FLOWER AND ORNAMENTAL DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
<b>CARNATION</b>								
<b>Botrytis blight</b> <b>(<u>Botrytis cinerea</u>)</b>	<b>benomyl</b>			<b>WP</b>	<b>4 oz.</b>	<b>--</b>	<b>Begin when disease first appears; repeat at 10-14 day intervals as necessary, more frequently under severe disease conditions.</b>	
	<b>zineb</b>			<b>WP or D</b>	<b>1.125-1.5</b>	<b>2-2.6</b>	<b>Begin when disease threatens or before disease appears; repeat at 7-10 day intervals, more frequently during periods of prolonged rainfall or high humidity.</b>	
<b>Leaf spot</b> <b>(<u>Septoria dianthi</u>)</b>	<b>ferbam</b>			<b>WP or D</b>	<b>0.76-1.14</b>	<b>Dust to cover</b>	<b>Begin after plants are well established and before disease appears; repeat at 7-10 day intervals until bloom and after bloom as necessary.</b>	
	<b>zineb</b>			<b>WP or D</b>	<b>1.125-1.5</b>	<b>2-2.6</b>	<b>Begin when disease threatens or before disease appears; repeat at 7-10 day intervals, more frequently during periods of prolonged rainfall or high humidity.</b>	



FLOWER AND ORNAMENTAL DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
CARNATION								
Powdery mildew ( <u>Oidium</u> sp.)	benomyl			WP	4 oz.	--	Begin when disease first appears; repeat at 10-14 day intervals as necessary, more frequently under severe disease conditions.	
	zineb			WP or D	1.125-1.5	2-2.6	Begin when disease threatens or before disease appears; repeat at 7-10 day intervals, more frequently during periods of prolonged rainfall or high humidity.	
Fusarium root rot ( <u>Fusarium</u> spp.)	zineb (greenhouse)			WP	0.2 lb./ 12.5 gal./ 100 sq. ft. of bench space.	--	Begin when disease threatens or before disease appears; repeat at 7-10 day intervals.	
CHRYSANTHEMUM								
Leaf spots ( <u>Septoria</u> spp. and <u>Cylindrosporium</u> <u>chrysanthemi</u> )	captan			WP	1	--	Apply at first sign of disease; repeat at 7-10 day intervals.	

Continued

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FLOWER AND ORNAMENTAL DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
CHRYSANTHEMUM								
Leaf spots ( <u>Septoria</u> spp. and <u>Cylindrosporium</u> <u>chrysanthemi</u> ) (con.)	ferbam			WP or D	0.76-1.14	Dust to cover	Begin after plants are well established and before disease appears; repeat at 7-10 day inter- vals until bloom and after bloom as necessary.	
	folpet			WP	0.5-1.0	--	Begin immediately after planting; repeat at 7-10 day intervals, more frequently during rains or high humidity.	
	zineb			WP or D	1.125-1.5	2-2.6	Begin when disease threatens or before disease appears; repeat at 7-10 day intervals, more frequently during periods of prolonged rainfall or high humidity.	
	ziram			WP	1.14-1.52	--	Apply at 7-10 day inter- vals as needed.	
Ascochyta ray blight ( <u>Mycosphaerella</u> <u>ligulicola</u> )	zineb			WP or D	1.125-1.5	2-2.6	Apply at 14-day inter- vals during bloom.	

## FLOWER AND ORNAMENTAL DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
CHRYSANTHEMUM								
Botrytis blight ( <u>Botrytis cinerea</u> )	benomyl			WP	4 oz.	--	Begin when disease first appears; repeat at 10-14 day intervals as necessary, more frequently under severe disease conditions.	For cuttings, see manufacturer's label.
	captan			WP	1	--	Apply at first sign of disease; repeat at 7-10 day intervals.	
	DCNA			WP or D	0.28-0.56	0.64-1.8	Spray foliage and flowers at 7-14 day intervals.	
	zineb			WP or D	1.125-1.5	2-2.6	Begin when disease threatens or before disease appears; repeat at 7-10 day intervals, more frequently during periods of prolonged rainfall or high humidity.	
Rust ( <u>Puccinia chrysanthemi</u> )	ferbam			WP or D	0.76-1.14	Dust to cover	Begin after plants are well established and before disease appears; repeat at 7-10 day intervals until bloom and after bloom as necessary.	

**FLOWER AND ORNAMENTAL DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
<b>CHRYSANTHEMUM</b>								
<b>Powdery mildew (<u>Erysiphe</u> <u>cichoracearum</u>)</b>	benomyl			WP	4 oz.	--	Begin when disease first appears; repeat at 10-14 day intervals as necessary, more frequently under severe disease conditions.	
	cycloheximide				5 ppm	--	Spray all leaf and stem surfaces. Begin when disease first appears; repeat at 3-7 day intervals.	
	dinocap			LC or D	1.92-3.84 oz. LC, field; 1.92 oz., greenhouse	0.3-0.5 D	Begin when disease first appears; repeat at 10 day intervals as necessary.	
<b>Damping-off (<u>Rhizoctonia</u> sp.)</b>	DCNA			WP or D	1	Thorough D	Dip, drain, and plant cuttings or dust thoroughly and plant.	
<b>CYCLAMEN</b>								
<b>Botrytis blight (<u>Botrytis</u> sp.) and Leaf spots</b>	benomyl			WP	4 oz.	--	Begin when disease first appears; repeat at 10-14 day intervals as necessary, more frequently under severe disease conditions.	

Continued

**FLOWER AND ORNAMENTAL DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
CYCLAMEN								
Botrytis blight ( <i>Botrytis</i> sp.) and Leaf spots (con.)	ferbam			WP or D	0.76-1.14	Dust to cover	Begin after plants are well established and before disease appears; repeat at 7-10 day inter- vals until bloom and after bloom as necessary.	
	zineb			WP or D	1.125-1.5	2-2.6	Begin when disease threatens or before disease appears; repeat at 7-10 day intervals, more frequently during periods of prolonged rainfall or high humidity.	
DAFFODIL								
(See Narcissus and Daffodil)								
DAHLIA								
Botrytis blight ( <i>Botrytis cinerea</i> ) and Powdery mildew ( <i>Erysiphe cichoracearum</i> )	benomyl			WP	4 oz.	--	Begin when disease first appears; repeat at 10-14 day intervals as neces- sary, more frequently under severe disease conditions.	

Continued

FLOWER AND ORNAMENTAL DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
DAHLIA								
Botrytis blight ( <u>Botrytis cinerea</u> ) and Powdery mildew ( <u>Erysiphe cichoracearum</u> ) (con.)	dinocap			LC or D	1.92-3.84 oz. LC, field; 1.92 oz., greenhouse	0.3-0.5 D	Begin when disease first appears; repeat at 10- day intervals as neces- sary.	
	zineb			WP or D	1.125-1.5	2-2.6	Begin when disease threat- ens or before disease appears; repeat at 7-10 day intervals, more frequently during periods of prolonged rainfall or high humidity.	
DELPHINIUM AND LARKSPUR								
Powdery mildew ( <u>Erysiphe polygoni</u> )	benomyl			WP	4 oz.	--	Begin when disease first appears; repeat at 10-14 day intervals as neces- sary, more frequently under severe disease conditions.	
	dinocap			LC or D	1.92-3.84 oz. LC, field; 1.92 oz., greenhouse	0.3-0.5 D	Begin when disease first appears; repeat at 10- day intervals as neces- sary.	
	zineb			WP or D	1.125-1.5	2-2.6	Begin when disease threatens or before disease appears; repeat at 7-10 day intervals, more frequently during periods of prolonged rainfall or high humidity.	

**FLOWER AND ORNAMENTAL DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
DELPHINIUM AND LARKSPUR								
Botrytis blight ( <u>Botrytis cinerea</u> ), Leaf spot ( <u>Ascochyta aquilegiae</u> ), Cercospora leaf spot ( <u>C. delphini</u> ), Septoria leaf spot ( <u>S. delphinellae</u> ), and Rust ( <u>Puccinia reconidita</u> )	benomyl      zineb			WP   WP or D	4 oz.   1.125-1.5	--   2-2.6	Begin when disease first appears; repeat at 10-14 day intervals, more frequently under severe disease conditions.  Begin when disease threatens or before disease appears; repeat at 7-10 day intervals, more frequently during periods of prolonged rainfall or high humidity.	For Botrytis blight only.
DIEFFENBACHIA								
Bacterial stem rot ( <u>Erwinia</u> sp.)	streptomycin			--	100 ppm solution	--	Spray stock plants at 5-7 day intervals. Soak cuttings for 20 minutes in 200 ppm solution and plant in sterile rooting medium.	
DOGWOOD								
Flower blight ( <u>Botrytis cinerea</u> ) and Leaf spots ( <u>Cercospora</u> spp. and <u>Septoria</u> spp.)	benomyl			WP	4 oz.	--	Begin when disease first appears; repeat at 10-14 day intervals as neces- sary, more frequently under severe disease conditions.	

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Use Pesticides Safely—Follow the Label

**FLOWER AND ORNAMENTAL DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
<b>DOGWOOD</b>	zineb			WP	1.125-1.5	--	Apply at bud break; repeat 7-12 days later.	
Flower blight ( <i>Botrytis cinerea</i> ) and Leaf spots ( <i>Cercospora</i> spp. and <i>Septoria</i> spp.) (con.)								
Anthrachnose ( <i>Elsinea corni</i> )	maneb			WP	0.8-1.2	--	Begin when buds open; repeat when bracts fall 4 weeks later and in late summer.	
<b>EUONYMUS</b>	benomyl  dinocap  zineb			WP	4 oz.	--	Begin when disease first appears; repeat at 10-14 day intervals as necess- ary, more frequently under severe disease conditions.	
Powdery mildew ( <i>Microsphaera alni</i> )				LC or D	1.92-2.84 oz. LC, field; 1.92 oz., greenhouse	0.3-0.5 D	Begin when disease first appears; repeat at 10- day intervals as necessary.	
				WP	1.125-1.5	--	Apply at bud break; repeat 7-12 days later.	



**FLOWER AND ORNAMENTAL DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
EUONYMUS	zineb			WP	1.125-1.5	--	Apply at bud break; repeat 7-12 days later.	
Leaf spot								
FIRETHORN								

(See Pyracantha)

GARDENIA								
Botrytis, or bud rot, and Leaf spot ( <u>Botrytis cinerea</u> )	benomyl			WP	4 oz.	--	Begin when disease first appears; repeat at 10-14 day intervals as neces- sary, more frequently under severe disease conditions.	
	ferbam			WP or D	0.76-1.14	Dust to cover	Begin when plants are well established and before disease appears; repeat at 3-4 day inter- vals until bloom and after bloom as necessary.	
GERANIUM								
Botrytis gray mold ( <u>Botrytis cinerea</u> )	benomyl			WP	4 oz.	--	Begin when disease first appears; repeat at 10-14 day intervals as neces- sary, more frequently under severe disease conditions.	

Continued

**FLOWER AND ORNAMENTAL DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
<b>GERANIUM</b>								
<b>Botrytis gray mold (<i>Botrytis cinerea</i>) (con.)</b>	<b>chlorothalonil</b>			WP	1.126	--	Apply at first sign of disease; repeat at 7-14 day intervals throughout growing season. Use 7-day intervals during wet weather or severe disease conditions.	For greenhouse use, apply 2 grams/1000 cu. ft. of space or for each 50 feet of greenhouse length. Vaporize by heating in a shallow pan at 600-700° F. (See manufacturer's label.)
	<b>DCNA</b>			WP	0.28-0.56	--	Spray, dip, or dust to cover stock, greenhouse plants, and cuttings. Begin when disease is anticipated or first appears. Spray foliage and flowers at 7-14 day intervals or 5-7 days during cool, damp weather.	
	<b>zineb</b>			WP or D	1.125-1.5	2-2.6	Begin when disease threatens or before disease appears; repeat at 7-10 day intervals, more frequently during periods of prolonged rainfall or high humidity.	
<b>Alternaria leaf spot (<i>Alternaria tenuis</i>)</b>	<b>zineb</b>			WP or D	1.125-1.5	2-2.6	Begin when disease threatens or before disease appears; repeat at 7-10 day intervals, more frequently during periods of prolonged rainfall or high humidity.	

**FLOWER AND ORNAMENTAL DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
<b>GLADIOLUS</b>								
Botrytis gray mold ( <u>Botrytis cinerea</u> and <u>B. gladiolorum</u> )	benomyl			WP	4 oz.	--	Begin when disease first appears; repeat at 10-14 day intervals as neces- sary, more frequently under severe disease conditions.	
	ferbam			WP	1.5	--	Begin after plants are well established and before disease appears; repeat at 7-10 day inter- vals until bloom and after bloom as necessary.	
	thiram			D	--	5% D	Dust corms lightly. Plant immediately after treatment. Dust and mix with covering soil.	
	zineb			WP or D	1.125-1.5	2-2.6	Begin when foliage appears; repeat at 3-7 day intervals until spikes form.	
Leaf spots ( <u>Alternaria</u> sp., <u>Curvularia lunata</u> , <u>Septoria gladioli</u> , and <u>Stemphylium</u> sp.)	ferbam			WP or D	0.76-1.14	Dust to cover	Begin after plants are well established and before disease appears; repeat at 7-10 day inter- vals until bloom and after bloom as necessary.	

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## FLOWER AND ORNAMENTAL DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
GLADIOLUS								
Leaf spots ( <i>Alternaria</i> sp., <i>Curvularia lunata</i> , <i>Septoria gladioli</i> , and <i>Stemphylium</i> sp.) (con.)	maneb			WP or D	1.2	1.7-2.2	Begin when flower spikes are developing; repeat 2-3 times at weekly intervals.	
	zineb			WP	1.125-1.5	2-2.6	Begin when foliage appears; repeat at 3-7 day intervals until spikes form.	
	ziram			WP	1.14-1.52	--	Apply at weekly intervals.	
Corm rots and decay	captan			WP	2	--	Dip corms 20-30 minutes, drain, and plant.	
	thiabendazole			1080 ppm	--	--	See manufacturer's label.	
	thiram			D	--	5% D	Dust corms lightly. Plant immediately after treatment. Dust and mix with covering soil.	
HOLLYHOCK								
Rust ( <i>Puccinia malvacearum</i> )	ferbam			WP	0.76-1.14	Dust to cover	Begin after plants are well established and before disease appears; repeat at 7-10 day inter- vals until bloom and after bloom as necessary.	

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**FLOWER AND ORNAMENTAL DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
<b>HOLLYHOCK</b>								
Rust ( <u>Puccinia</u> <u>malvacearum</u> ) (con.)	zineb			WP or D	1.125-1.5	2-2.6	Begin when disease threatens or before disease appears; repeat at 7-10 day intervals, more frequently during periods of prolonged rainfall or high humidity.	
Anthracnose ( <u>Colletotrichum</u> <u>malvarum</u> )	captan			D	--	2.1	Apply as a dust before disease appears; repeat at weekly intervals during warm, wet weather.	
	zineb			WP or D	1.125-1.5	2-2.6	Begin when disease threatens or before disease appears; repeat at 7-10 day intervals, more frequently during periods of prolonged rainfall or high humidity.	
Leaf spots	zineb			WP or D	1.125-1.5	2-2.6	Begin when disease threatens or before disease appears; repeat at 7-10 day intervals, more frequently during periods of prolonged rainfall or high humidity.	
<b>HYACINTH</b>								
Bulb rot ( <u>Botrytis</u> and <u>Fusarium</u> spp.)	benomyl			WP	4 oz.	--	Begin when disease first appears; repeat at 10-14 day intervals as necessary, more frequently under severe disease conditions.	For Botrytis blight only.

Continued

**FLOWER AND ORNAMENTAL DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
<b>HYACINTH</b>								
Bulb rot ( <i>Botrytis</i> and <i>Fusarium</i> spp.) (con.)	thiabendazole			1080 ppm	--	--	See manufacturer's label.	For <i>Fusarium</i> only.
	thiram			D or SL	1.6 oz./gal. water as a SL	--	Dust bulbs lightly with 5.0-12.0% dust or use 1.6 oz./gal. water as a slurry. Plant immediate- ly, dry for storage, or dust and mix with cover- ing soil.	
<b>HYDRANGEA</b>								
Botrytis gray mold ( <i>Botrytis cinerea</i> )	benomyl			WP	4 oz.	--	Begin when disease first appears; repeat at 10-14 day intervals as neces- sary, more frequently under severe disease conditions.	
	DCNA			WP or D	1	1.8	Apply before lifting for shipment or storage. Begin before disease appears.	
				WP or D	0.5-0.75	Dust to cover	Begin before disease appears; repeat as necessary on potted plants and cuttings in the rooting bench.	

Continued

**FLOWER AND ORNAMENTAL DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
<b>HYDRANGEA</b>								
<b>Botrytis gray mold (<u>Botrytis cinerea</u>) (con.)</b>	<b>zineb</b>			<b>WP or D</b>	<b>1.125-1.5</b>	<b>2-2.6</b>	<b>Begin when disease threatens or before disease appears; repeat at 7-10 day intervals, more frequently during periods of prolonged rainfall or high humidity.</b>	
<b>Rust (<u>Pucciniastrum hydrangeae</u>) and Leaf spots</b>	<b>zineb</b>			<b>WP or D</b>	<b>1.125-1.5</b>	<b>2-2.6</b>	<b>Begin when disease threatens or before disease appears; repeat at 7-10 day intervals, more frequently during periods of prolonged rainfall or high humidity.</b>	
<b>Powdery mildew (<u>Erysiphe polygoni</u> and <u>Oidium</u> sp.)</b>	<b>benomyl</b>			<b>WP</b>	<b>4 oz.</b>	<b>--</b>	<b>Begin when disease first appears; repeat at 10-14 day intervals as neces- sary, more frequently under severe disease conditions.</b>	
	<b>dinocap</b>			<b>LC or D</b>	<b>1.92-3.84 oz. LC, field; 1.92 oz., greenhouse</b>	<b>0.3-0.5 D</b>	<b>Begin when disease first appears; repeat at 10- day intervals as necessary.</b>	
	<b>zineb</b>			<b>WP or D</b>	<b>1.125-1.5</b>	<b>2-2.6</b>	<b>Begin when disease threatens or before disease appears; repeat at 7-10 day intervals, more frequently during periods of prolonged rainfall or high humidity.</b>	

FLOWER AND ORNAMENTAL DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
IRIS								
Leaf spot ( <u>Didymellina</u> <u>macrospora</u> )	folpet			WP or D	1	2.6	Begin when plants emerge; repeat at 7-10 day inter- vals.	
	zinc ion-maneb complex			WP	1.2	--	Full coverage sprays. Begin when plants are well leafed out; repeat at 7-10 day intervals as long as necessary.	
Fusarium basal rot ( <u>Fusarium</u> spp.)	thiabendazole			1080 ppm	--	--	See manufacturer's label.	
Botrytis leaf blight ( <u>Botrytis</u> sp.), Alternaria leaf spot ( <u>Alternaria</u> sp.), and Rust ( <u>Puccinia iridis</u> )	benomyl			WP	4 oz.	--	Begin when disease first appears; repeat at 10-14 day intervals as neces- sary, more frequently under severe disease conditions.	For Botrytis blight only.
	zineb			WP or D	1.125-1.5	2-2.6	Begin when disease threatens or before disease appears; repeat at 7-10 day intervals, more frequently during periods of prolonged rainfall or high humidity.	



**FLOWER AND ORNAMENTAL DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
IVY, BOSTON	ferbam			WP or D	0.76-1.14	Dust to cover	Begin after plants are well established and before disease appears; repeat at 7-10 day inter- vals until bloom and after bloom as necessary.	
Leaf spots								
IVY, ENGLISH	ferbam			WP or D	0.76-1.14	Dust to cover	Begin after plants are well established and before disease appears; repeat at 7-10 day inter- vals until bloom and after bloom as necessary.	
Leaf spot and twig blight ( <u>Phyllosticta</u> <u>concentrica</u> ) and Leaf spot and stem spot ( <u>Amerosporium</u> <u>trichellum</u> )								
	zineb			WP or D	1.125-1.5	2-2.6	Begin when disease threatens or before disease appears; repeat at 7-10 day intervals, more frequently during periods of prolonged rainfall or high humidity.	
LARKSPUR								

(See Delphinium and Larkspur)

**FLOWER AND ORNAMENTAL DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
LAUREL	ferbam			WP or D	0.76-1.14	Dust to cover	Begin after plants are well established and before disease appears; repeat at 7-10 day inter- vals until bloom and after bloom as necessary.	
Leaf spots								
LILAC	benomyl			WP	4 oz.	--	Begin when disease first appears; repeat at 10-14 day intervals as necessary, more frequently under severe disease conditions.	
Powdery mildew ( <u>Microsphaera alni</u> )								
	dinocap			LC or D	1.92-3.84 oz. LC, field; 1.92 oz., greenhouse	0.3-0.5 D	Begin when disease first appears; repeat at 10-day intervals as necessary.	
	zineb			WP	1.125-1.5	--	Apply at bud break; repeat 7-12 days later.	
Leaf spot	zineb			WP	1.125-1.5	--	Apply at bud break; repeat 7-12 days later.	

**FLOWER AND ORNAMENTAL DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
<b>LILY</b>								
<b>Botrytis blight</b> <b>(<u>Botrytis cinerea</u></b> <b>and <u>B. elliptica</u>)</b>	benomyl			WP	4 oz.	--	Begin when disease first appears; repeat at 10-14 day intervals as necessary, more frequently under severe disease conditions.	
	bordeaux mixture			WP	6.0-7.0	--	Begin in early spring before disease appears; repeat at 7-10 day intervals.	
	zinc ion-maneb complex			WP	1.2	--	Field coverage sprays. Begin when plants are well leafed out; repeat at 7-10 day intervals as long as necessary.	
	zineb			WP or D	1.125-1.5	2-2.6	Begin when disease threatens or before disease appears; repeat at 7-10 day intervals, more frequently during periods of prolonged rainfall or high humidity.	
<b>MARIGOLD</b>								
<b>Rust</b> <b>(<u>Puccinia</u></b> <b><u>chrysanthemi</u>)</b>	ferbam			WP or D	1	2.6	Apply at 3-7 day intervals during periods of rapid growth or high humidity.	

**FLOWER AND ORNAMENTAL DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
MARIGOLD								
Damping-off ( <u>Rhizoctonia</u> sp.)	SOPP			WP	10 grams 97% tetra- hydrate/ 2.5 gal. water (1030 ppm actual tetra- hydrate)	--	Soak planting media, flats, and benches, and spray soil surface with fine mist daily after seedlings emerge until plants are well established.	
NARCISSUS AND DAFFODIL								
Bulb rot ( <u>Botrytis</u> and <u>Fusarium</u> spp.)	benomyl			WP	4 oz.	--	Begin when disease first appears; repeat at 10-14 day intervals as neces- sary, more frequently under severe disease conditions.	
	thiabendazole			1080 ppm	--	--	See manufacturer's label.	For Fusarium only.
	thiram			D	--	--	Dust bulbs lightly with 5.0-12.0% dust or use 1.6 oz./gal. water as a slurry. Plant immediate- ly, dry for storage, or dust and mix with covering soil.	

**FLOWER AND ORNAMENTAL DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
<b>ORCHID</b>								
Brown spot ( <u>Phytophthora</u> <u>cattleyae</u> ), Heart rot and leaf black rot ( <u>Phytophthora</u> <u>cactorum</u> ), and Root rot ( <u>Rhizoctonia solani</u> )	8-quinolinol sulfate			L	390 ppm solution in water (1 oz. 5% formulation /gal.) + spreader sticker	--	Dip infected plants, including growing media and pots, for 1 hour; repeat in 1 week if disease persists.	
	SOPP			WP	10 grams of 97% tetra- hydrate/ 5 gal. water (514 ppm actual tetra- hydrate)	--	Submerge entire plant for about 1 hour, longer for large plants; repeat as necessary.	
Damping-off and Black leaf spot	hydroxyquinoline benzoate			L	1 gal. of 2.5%/ 50-100 gal.	--	Dip pot and entire plant; repeat as necessary.	
<b>PACHYSANDRA</b>								
Volutella blight ( <u>Volutella</u> <u>pachysandrae</u> )	zinc ion-maneb complex			WP	1.6/50 gal. /5000 sq. ft.	--	Begin at first sign of disease; repeat at about 10-14 day intervals for a minimum of 5 applications.	

FLOWER AND ORNAMENTAL DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
PANSY								
Anthracnose ( <u>Colletotrichum</u> <u>violae-tricoloris</u> )	zinc ion-maneb complex			WP	1.2	--	Full coverage sprays. Begin when plants are well leafed out; repeat at 7-10 day intervals as long as necessary.	
	zineb			WP or D	1.125-1.5	2-2.6	Begin when disease threatens or before disease appears; repeat at 7-10 day intervals, more frequently during periods of prolonged rainfall or high humidity.	
PEONY								
Botrytis blight ( <u>Botrytis cinerea</u> )	benomyl			WP	4 oz.	--	Begin when disease first appears; repeat at 10-14 day intervals as neces- sary, more frequently under severe disease conditions.	
	bordeaux mixture			WP	6.0-7.0	--	Begin in early spring be- fore disease appears; repeat at 7-10 day intervals.	
	ferbam			WP or D	0.76-1.14	Dust to cover	Begin after plants are well established and before disease appears; repeat at 7-10 day inter- vals until bloom and after bloom as neces- sary.	

Continued

**FLOWER AND ORNAMENTAL DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
PEONY								
Botrytis blight ( <u>Botrytis cinerea</u> ) (con.)	zinc ion-maneb complex			WP	1.2	--	Apply in early spring and early fall, drench- ing foliage and soil around plants. Destroy all infected plant parts promptly.	
	zineb			WP or D	1.125-1.5	2-2.6	Begin when disease threatens or before disease appears; repeat at 7-10 day intervals, more frequently during periods of prolonged rainfall or high humidity.	
PHILODENDRON								
Bacterial leaf spot ( <u>Erwinia chrysanthemi</u> )	streptomycin			L	200 ppm solution	--	Remove all decayed leaves. Spray with 200 ppm solution as a preventive or at first sign of water-soaked leaves; repeat at 4-5 day intervals.	
POINSETTIA								
Botrytis blight ( <u>Botrytis cinerea</u> )	benomyl			WP	4 oz.	--	Begin when disease first appears; repeat at 10-14 day intervals as neces- sary, more frequently under severe disease conditions.	

Continued

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**FLOWER AND ORNAMENTAL DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
POINSETTIA	ferbam			WP or D	0.76-1.14	Dust to cover	Begin after plants are well established and before disease appears; repeat at 7-10 day inter- vals until bloom and after bloom as necessary.	
Botrytis blight ( <u>Botrytis cinerea</u> ) (con.)								
Pythium root rot ( <u>Pythium</u> spp.)	Bay 22555			WP	--	--	See manufacturer's label.	
Stem rot ( <u>Rhizoctonia solani</u> )	PCNB			WP or D	65	65	Mix into top 2 inches of soil or use 82 lb./300 gal./acre as a soil drench before planting.	
PRIVET	bordeaux mixture			WP 5-5-50 for root rot  4-4-100 for leaf spots	10 copper sulfate + 10 lime	--	Spray base of tree and surrounding soil when infection is detected.	
Dermatophora root rot ( <u>Dermatophora</u> sp.) and Anthracnose leaf spots ( <u>Glomerella</u> <u>cingulata</u> )					4 copper sulfate + 4 lime	--	Begin in spring before new growth occurs; repeat 1 or 2 times as necessary.	



CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
PYRACANTHA (FIRETHORN)  Fireblight ( <i>Erwinia amylovora</i> )	streptomycin			L	100 ppm solution	--	Begin spraying at start of blossom period; repeat at 3-4 day intervals during bloom and at 5-7 day intervals after bloom if weather favors disease spread.	
RHODODENDRON								

(See Azalea and Rhododendron)

ROSE								
Powdery mildew ( <i>Sphaerotheca humuli</i> )	benomyl			WP	4 oz.	--	Begin when disease first appears; repeat at 10-14 day intervals as neces- sary, more frequently under severe disease conditions.	
	cycloheximide			--	2 ppm	--	Spray all leaf and stem surfaces. Begin when disease first appears; repeat at 7-day intervals, 3-5 days if disease is severe.	For roses other than rambler.

Continued

**FLOWER AND ORNAMENTAL DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
ROSE								
<u>Powdery mildew</u> ( <u>Sphaerotheca</u> <u>humuli</u> ) (con.)	folpet			WP or D	1	2.6	Begin when first leaves unfold; repeat at 7-10 day intervals through season.	Addition of wetting agents may cause in- jury to roses.
	dinocap			WP or LC	1.5-2 oz. WP or LC, for field; for greenhouse use, see manufactur- er's label	--	Begin when disease appears; repeat at 4-7 day intervals.	Apply with care in greenhouse when temperatures approach 85° F. Do not apply at temperatures over 90° F.
	SOPP			WP	10 grams of 97% tetra- hydrate/5 gal. water (514 ppm actual tetra- hydrate) + a detergent type spreader	--	Spray stalks, stem, and both sides of leaves and saturate soil surface shaded by rose foliage. Begin before disease appears or at first sign of disease; repeat at 4-7 day intervals.	
	zineb			WP or D	1.125-1.5	2-2.6	Begin when foliage first appears.	
<u>Black spot</u> ( <u>Diplocarpon rosae</u> ) and Rust ( <u>Phragmidium</u> sp.)	folpet			WP or D	1	2.6	Begin when first leaves unfold; repeat at 7-10 day intervals throughout season.	Approved for black spot only.  Addition of wetting agents may cause in- jury to roses.
	maneb			WP or D	0.8-1.2	1.2-2.1	Begin when first leaves unfold; repeat at 7-10 day intervals.	Approved for rust only in California.
	NIA 9102			WP	1.2	--	Apply when new growth first appears; repeat at 3-7 day intervals.	Approved for black spot only.

Continued

FLOWER AND ORNAMENTAL DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
ROSE								
Black spot ( <u>Diplocarpon rosae</u> ) and Rust ( <u>Phragmidium</u> sp.) (con.)	zineb			WP or D	1.125-1.5	2-2.6	Begin when foliage first appears.	
Botrytis gray mold and Blossom blight ( <u>Botrytis cinerea</u> )	benomyl			WP	4 oz.	--	Begin when disease first appears; repeat at 10-14 day intervals as neces- sary, more frequently under severe disease conditions.	
	captan			WP or D	1	2.25-3.0	Begin at first growth or at first sign of disease; repeat at 7-14 day inter- vals, more frequently during frequent rains or heavy dews.	
	chlorothalonil			WP or D	0.75	5%, dust thoroughly	Apply at first sign of disease; repeat at 7-14 day intervals throughout growing season. Use 7-day intervals during wet weather or severe disease conditions.	
	zineb			WP or D	1.125-1.5	2-2.6	Begin when foliage first appears.	
SNAPDRAGON								
Rust ( <u>Puccinia antirrhini</u> )	maneb			WP or D	0.8-1.2	1.2-2.4	Begin with emergence; repeat at 7-10 day inter- vals.	

Continued

**FLOWER AND ORNAMENTAL DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
SNAPDRAGON								
Rust ( <u>Puccinia antirrhini</u> ) (con.)	zinc ion-maneb complex			WP	1.2	--	Full coverage sprays. Begin when plants are well leafed out; repeat at 7-10 day intervals as long as necessary.	
	zineb			WP or D	1.125-1.5	2-2.6	Begin when disease threatens or before disease appears; repeat at 7-10 day intervals, more frequently during periods of prolonged rainfall or high humidity.	
Anthrachnose ( <u>Colletotrichum</u> <u>antirrhini</u> ), Botrytis blight ( <u>Botrytis cinerea</u> ), Leaf spot ( <u>Phyllosticta</u> <u>antirrhini</u> ), and Downy mildew ( <u>Peronospora</u> <u>antirrhini</u> )	zineb			WP or D	1.125-1.5	2-2.6	Begin when disease threatens or before disease appears; repeat at 7-10 day intervals (2-4 day intervals for downy mildew only), more frequently during periods of prolonged rainfall or high humidity.	
Powdery mildew ( <u>Oidium</u> sp.)	benomyl			WP	4 oz.	--	Begin when disease first appears; repeat at 10-14 day intervals as neces- sary, more frequently under severe disease conditions.	

Continued

**FLOWER AND ORNAMENTAL DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
<b>SNAPDRAGON</b>								
Powdery mildew ( <i>Oidium</i> sp.) (con.)	dinocap			LC or D	1.92-3.84 oz. LC, field; 1.92 oz., greenhouse.	0.3-0.5 D	Begin when disease first appears; repeat at 4-7 day intervals as neces- sary.	
	zineb			WP or D	1.125-1.5	2-2.6	Begin when disease threatens or before disease appears; repeat at 7-10 day intervals, more frequently during periods of prolonged rainfall or high humidity.	
Damping-off and Basal stem rot ( <i>Rhizoctonia</i> sp. and <i>Sclerotinia</i> sp.)	PCNB			WP or D	65	65	For <i>Rhizoctonia</i> mix into top 2 inches of soil, or use 82.0 lb./300 gal./ acre as a soil drench before planting.	
					100 WP in sufficient water or as a dust/acre	--	For <i>Sclerotinia</i> apply, 1 week before planting. Mix to a depth of 4 inches.	
	SOPP			WP	10 grams 97% tetra- hydrate/ 2.5 gal. water (1030 ppm actual tetra- hydrate)	--	Soak planting media, flats, and benches and spray soil surface with a fine mist daily after seedlings emerge until plants are well established.	

**FLOWER AND ORNAMENTAL DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
<b>TULIP</b>								
<b>Botrytis blight</b> <b>(<u>Botrytis tulipae</u>)</b>	benomyl			WP	4 oz.	--	Begin when disease first appears; repeat at 10-14 day intervals as necessary, more frequently under severe disease conditions.	
	thiram			D or SL	1.6 oz./ gal. water as a SL	--	Dust bulbs lightly with 5.0-12.0% dust or use 1.6 oz./gal. water as a slurry. Plant immediately, dry for storage, or dust and mix with covering soil.	
	zinc ion-maneb complex			WP	1.2	--	Full coverage sprays. Begin when plants are well leafed out; repeat at 7-10 day intervals as long as necessary.	
	zineb			WP or D	1.125-1.5	2-2.6	Begin when disease threatens or before disease appears; repeat at 7-10 day intervals, more frequently during periods of prolonged rainfall or high humidity.	
<b>Black rot</b> <b>(<u>Sclerotinia</u> sp.)</b> <b>and Crown rot</b> <b>(<u>Sclerotium</u></b> <b><u>rolfsii</u>)</b>	PCNB			D	--	100-200	Apply in broadcast pre-planting treatment and mix into upper 6-7 inches of soil; or apply to bulbs and furrow at time of planting; or dip bulbs for 5 min. in suspension of 46.5 lb./100 gal. water to which 1.0% of suitable sticker has been added.	
				WP or D	35.0-70.0	35.0-70.0		

**FLOWER AND ORNAMENTAL DISEASES**

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					PER 100 GAL.	PER ACRE		
<b>ZINNIA</b>								
Leaf blight ( <u>Alternaria zinniae</u> ) and Leaf spot ( <u>Cercospora zinniae</u> )	maneb			WP or D	0.8-1.2	1.2-2.4	Begin when new growth appears; repeat weekly.	
	zinc ion-maneb complex			WP	1.2	--	Full coverage sprays. Begin when plants are well leafed out; repeat at 7-10 day intervals as long as necessary.	
	zineb			WP or D	1.125-1.5	2-2.6	Begin when disease threatens or before disease appears; repeat at 7-10 day intervals, more frequently during periods of prolonged rainfall or high humidity.	
Powdery mildew ( <u>Erysiphe cichoracearum</u> )	benomyl			WP	4 oz.	--	Begin when disease first appears; repeat at 10- 14 day intervals as necessary, more frequent- ly under severe disease conditions.	
	dinocap			LC or D	1.92-3.84 oz. LC, field; 1.92 oz., greenhouse.	0.3-0.5 D	Begin when disease first appears; repeat at 10-day intervals as necessary.	

**FOREST TREE DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
CONIFER SEED								
Damping-off, seed decay, and seedling blights	thiram			WP	1.12 oz./ 100 lb. of seed	--	Mix as a slurry with seed until thoroughly coated.	Do not use treated seed for food, feed, or oil purposes or handle with bare hands.
CONIFER SEED: FIR AND PINE								
Seed decay and seedling blights	TCMTB			60% LC	0.53 fluid oz. in 1.33 qt. of water	--	Treat seed before stratification using a slurry.	
CONIFER SEED: PINE (in plastic bullets)								
Seed decay and seedling blights	TCMTB			60% LC	0.034 fluid oz. in water to make a total volume of 5.2 gal. Equiva- lent to 3 lb./acre	--	Treat surface of the 25 grams of soil in each bullet with 1.0 ml of the dilution.	



# FOREST TREE DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
FIR: DOUGLAS, RED, AND WHITE	MBR-CP			33-98% VL	---	300-600	Preplanting fumigation by injection under plastic covers.	Expose for 24 hours and aerate for 2-10 days before seed- ing or planting.
Root rots and other soilborne diseases, especially <u>Macrophomina</u> <u>phaseoli</u>								
FIR, WESTERN	borax			G	1 lb. should adequate- ly cover 50 sq. ft. of stump surface	--	Sprinkle dry on stump surface immediately after cutting. Apply only enough to cover stump surface lightly, but complete coverage, including exposed side areas and any splinters, is necessary.	Use restricted to true firs in California and adjacent Nevada.
Root rot ( <u>Fomes annosus</u> )								
PINE: AUSTRIAN AND PONDEROSA	bordeaux mixture			WP	8 copper sulfate + 8 lime	--	Three foliar sprays to point of runoff: 1) When new growth starts. 2) When needles begin to emerge from sheaths. 3) When needles are part- ly grown.	
Diplodia tip blight ( <u>Diplodia</u> <u>pineae</u> )								

## FOREST TREE DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
PINE: AUSTRIAN AND PONDEROSA								
Dothistroma needle blight ( <u>Dothistroma</u> <u>pini</u> )	bordeaux mixture			WP	8 copper sulfate + 8 lime	--	Foliar sprays to point of runoff in mid-May and mid-June.	
	copper salts of fatty and rosin acids			4Z	2 qt. or 4 tsp./ 1 gal.	--	Apply when new needles are just emerging; repeat 3 weeks later. Spray to wet all needles thoroughly.	North-Central States only. 2 qt. of 4Z formulation/100 gal.
PINE, EASTERN								
Root rots and other soilborne diseases, especially <u>Cylindrocladium</u> <u>scoparium</u>	MBR-CP			33-98% VL	--	300-600	Preplanting fumigation by injection under plastic covers.	Expose for 24 hours and aerate 2-10 days before seeding or planting.
Root rot ( <u>Fomes</u> <u>annosus</u> )	borax			G	1 lb. should adequately cover 50 sq. ft. of stump surface	--	Sprinkle dry on stump surface immediately after cutting. Apply only enough to cover stump surface lightly, but complete coverage, including exposed side areas and any splinters, is necessary.	
Needle disease such as: needle cast ( <u>Lophodermium</u> <u>pinastri</u> ) and brown spot ( <u>Scirrhia</u> <u>acicola</u> )	maneb			80Z WP	1.2 lb. plus 4 fluid oz. suitable spreader sticker	--	Spray nursery stock, plantation, or Christmas trees at 2-week intervals or following rains of more than 1/2 inch or after 48 hours of very high humidity from time new needles are 1/4 inch long until early October.	

## FOREST TREE DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
PINE, SCOTCH	bordeaux mixture			WP	8 copper sulfate + 8 lime	--	Three foliar sprays to point of runoff: 1) When new growth starts. 2) When needles begin to emerge from sheaths. 3) When needles are partly grown.	
Diplodia tip blight ( <u>Diplodia</u> <u>pineae</u> )								
PINE, SOUTHERN	MBR-CP			33-98% VL + solvent	--	300-600	Preplanting fumigation by injection under plastic covers.	Expose for 24 hours and aerate 2-10 days before seeding or planting.
Root rots and other soilborne diseases ( <u>Sclerotium</u> <u>bataticola</u> , <u>Fusarium</u> <u>oxysporum</u> , and others)								
Brown spot needle blight ( <u>Scirrhia</u> <u>acicola</u> )	bordeaux mixture			WP	8 copper sulfate + 8 lime	60 gal.	Spray nursery stock, plantation, or Christmas trees at 10-30 day intervals, depending on rainfall, late May- October. Dip may be substituted for final spray before lifting.	
	copper sulfate (basic)			WP	2.0 me- tallic copper equiva- lent	--	Begin before disease appears; repeat at 7-10 day intervals and after rains.	
				D	--	2.0	Begin before disease appears; repeat at 7-10 day intervals and after rains.	

# FOREST TREE DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
PINE, SOUTHERN								
Fusiform rust ( <u>Cronartium</u> <u>fusiforme</u> )	ferbam			WP	0.76-1.5	--	Apply at 3-7 day intervals on nursery stock from plant emergence to mid-June as needed.	Used on pine seedlings in nursery beds.
	ziram			76% WP	1.5	--	Apply at 3-5 day intervals on nursery stock, from plant emergence to mid-June.	
Southern cone rust ( <u>Cronartium strobilinum</u> ) in slash and loblolly pine	ferbam			76% WP	1.5 lb. plus 4 to 6 oz. of suitable spreader sticker	--	Begin at time of flowering when strobili are emerging from bud scales; repeat at 5-day intervals until pollination has ceased. Spray flower-bearing portions of tree crowns to runoff.	
Rhizoctonia needle blight	PCNB			75% WP	37.0	37.0	Apply to nursery beds; an additional 1/2 inch of water per acre should be applied by irrigation.	Plant seed immediately after irrigation or not later than one week.
PINE, WESTERN								
Root rots and other soilborne diseases, especially <u>Macrophomina phaseoli</u>	MBR-CP			33-98% VL	--	300-600	Preplanting fumigation by injection under plastic covers.	Expose for 24 hours and aerate 2-10 days before seeding or planting.

## FOREST TREE DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
PINE, WESTERN								
Root rot ( <u>Fomes annosus</u> )	borax			G	1 lb. should adequately cover 50 sq. ft. of stump surface.	--	Sprinkle dry on stump surface immediately after cutting. Apply only enough to cover stump surface lightly, but complete coverage, including exposed side areas and any splinters, is necessary.	Use restricted to western pines in California and adjacent Nevada.
SEEDLINGS, FOREST TREE NURSERIES								
Root rots and damping-off caused by <u>Rhizoctonia</u> , <u>Pythium</u> , <u>Phytophthora</u> , and <u>Fusarium</u> species	DMTT			LC or WP	--	255	Apply 2-3 weeks before planting, longer if soil is very wet or temperature is below 60° F. Mix thoroughly into soil or water in preplant soil fumigant for forest tree seed beds and seedling nurseries.	Do not apply within 3 to 4 feet of growing plants or closer than drip line of trees and shrubs. Prevent chemical from washing down to growing crops.
Root rots, damping-off, and wilt producing fungi	DD-MEUS			20% L	--	75-115	Preplant soil treatment in forest tree nurseries. Soil should be moist to a depth of at least 6 in. Apply with injection-type equipment to a depth of 6-8 in. Soil should be sealed immediately after treatment, preferably by tarping and left undisturbed for 4-7 days.	Do not plant if odor of fumigant is still detectable. Limits are 104 lb. of active ingredient in light soils and 132 lb. in heavy soils.

**FOREST TREE DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
SEEDLINGS, FOREST TREE NURSERIES								
Damping-off and seed and root rots	captan			WP	1	6.5	Apply to nursery beds at rate of 15 gal. of final spray per 1000 sq ft. as a preplant treatment; cultivate into upper 3 to 4 inches of soil.	
SEQUOIA, GIANT								
Root rots and other soilborne diseases	MBR-CP			33-98% VL	--	300-600	Preplanting fumigation by injection under plastic covers.	Expose for 24 hours and aerate 2-10 days before seeding or planting.
SPRUCE, EASTERN								
Root rots and other soilborne diseases, especially <u>Cylindrocladium</u> <u>scoparium</u>	MBR-CP			33-98% VL	--	300-600	Preplanting fumigation by injection under plastic covers.	Expose for 24 hours and aerate 2-10 days before seed- ing or planting.

**FRUIT DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
APPLE								
Scab ( <i>Venturia inaequalis</i> )	captan	25	NTL	WP or D	0.75-1	2-5	Primary infection: apply in prebloom, blossom, petal fall, and first cover periods.	Not compatible with oils or strong alkali such as lime or lime-sulfur.
					0.25	1.1-2.5	Secondary infection: apply in cover periods.	
	dichlone	3	1	WP or D	--	1.2-4	Begin at delayed dormant stage and follow State spray schedules and warning service announcements through calyx or first cover.	Some formulations should not be used with mixtures containing oil. Dichlone may cause injury to apples during periods of high temperature.
	dodine	5	5	WP or D	0.162-0.325	0.8-1.6	For protective schedule, begin at prebloom stage; repeat at 5-7 day intervals through first cover.	Do not graze cover crops in treated orchard. Do not use treated apples in apple pomace for use in livestock feed.
								Russetting may occur on Golden Delicious, Grimes Golden and Rhode Island Greening varieties, but no russetting has been observed in Northwestern States.
	ferbam	7	7	WP or D	0.76-1.52	2.9-4.0	Begin at prebloom; repeat in calyx and early cover stages. Reduce to 0.6 lb./100 gal. in late cover sprays.	Golden Delicious and other yellow varieties of apples are easily russetted by ferbam.

Continued

**FRUIT DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
APPLE								
Scab ( <i>Venturia inaequalis</i> ) (con.)	folpet	25	NTL	WP	0.75-1	--	Begin at delayed dormant; repeat at 7-14 day intervals through cover sprays, except in Western States do not apply between bloom and July 1 to avoid injury.	Russetting may be caused on sensitive varieties in Eastern States when used from just before bloom to 30 days after petal fall.
	glyodin	5	NTL	L	0.5	--	Begin at delayed dormant stage; repeat at prepink, pink, bloom, and petal fall stages, and in cover sprays.	Under certain conditions, glyodin may cause russetting on Golden Delicious apples. Do not use glyodin in Southern States.
	lime-sulfur	Safe	NTL	Dry powder	6-8	--	Apply 1.5-2 gal. of 29-31% solution/100 gal. in delayed dormant, prepink, and pink stages.	Sulfur may burn foliage when temperature is high. Do not make applications at such times. Do not use within 2 weeks of an oil spray application.
	maneb	2	15* 30**	WP	1.2-1.6 + suitable spreader sticker	10-20 gal. + suitable spreader by aircraft	Begin at calyx or first cover stages; repeat at 7-14 day intervals as necessary.	Best results obtained in prebloom, bloom and petal fall stages.
	thiram	7	NTL	WP or D	0.98-1.30	1.7-2.6	Begin at prebloom; repeat at bloom, petal fall, and in cover applications.	In New England States use 4.32 lb. as a dust or spray per acre.
					0.75-1.125	--	On West Coast only, apply in preblossom, calyx, and cover stages.	

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\*\* For other States.

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**FRUIT DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
<b>APPLE</b>								
<b>Botryosphaeria rot</b> ( <u>Botryosphaeria</u> <u>ribis</u> ) and Black rot (Frogeye leafspot) ( <u>Physalospora obtusa</u> )	captan	25	NTL	WP or D	1	2-3.75	Late cover and preharvest periods.	Not compatible with oils or strong alkali such as lime or lime-sulfur.
	ferbam	7	7	WP or D	0.76-1.52	2.9-4.0	Begin at petal fall; repeat in cover sprays. Reduce to 0.6 lb./100 gal. in late cover sprays.	Golden Delicious and other yellow varieties of apples are easily russeted by ferbam.
	folpet	25	NTL	WP	0.75-1	--	Begin at delayed dormant; repeat at 7-14 day intervals through cover sprays, except in Western States do not apply between bloom and July 1 to avoid injury.	Russetting may be caused on sensitive varieties in Eastern States when used from just before bloom to 30 days after petal fall.
	maneb	2	15* 30**	WP or D	1.2-1.6 + suitable spreader sticker	10-20 gal. + suitable spreader sticker, by aircraft	Begin at calyx or first cover stages; repeat at 7-14 day intervals as necessary.	
	thiram	7	NTL	WP or D	0.98-1.30	1.7-2.6	Begin at prebloom; repeat at bloom, petal fall, and in cover applications.	In New England States use 4.32 lb. per acre as a dust or spray.
<b>Fire blight</b> ( <u>Erwinia amylovora</u> )	10% to 20% copper sulfate (monohydrate) plus an excess of hydrated lime	Exempt	NTL	D	--	1.8 lb. metallic copper equivalent/ acre	Apply in 2-3 bloom sprays.	Geographical location determines dosage.

Continued

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Use Pesticides Safely—Follow the Label

**FRUIT DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
APPLE								
Fire blight ( <i>Erwinia amylovora</i> ) (con.)	streptomycin	0.25	50	WP or D	0.5-1.0 of 8.5% WP or 0.25-0.5 of 17% WP	--	Spray trees at 10% bloom; repeat at 3-5 day inter- vals until bloom is over. To control twig blight, continue sprays at 5-14 day intervals or 1500 ppm (40 lb.) of 0.15% dust per acre.	60 ppm spray at 600 gal. per acre and 1500 ppm dust for use in West Coast area only. 50- 100 ppm at 600 gal. per acre suggested for use in other parts of the country.
	zineb	2	15* 30**	WP	1.5	--	At 10% bloom, full bloom, and petal fall, or at 2-3 day intervals during blooming.	
Rusts ( <i>Gymnosporangium</i> <i>juniperi-virginianae</i> and <i>G. clavipes</i> )	ferbam	7	7	WP	0.76-1.52	--	Apply in prebloom, calyx, and early cover sprays.	Golden Delicious variety is easily russetted by ferbam.
	maneb	2	15* 30**	WP or D	1.2-1.6 + suitable spreader sticker	10-20 gal. + suitable spreader sticker, by aircraft	Begin at calyx or first cover stages; repeat at 7-14 day intervals as necessary.	
	thiram	7	NTL	WP or D	0.98-1.3	1.7-2.6	Apply in prebloom, calyx, and cover sprays, with one additional applica- tion during bloom, or keep foliage covered during infection periods.	In New England States use 4.32 lb. as a dust or spray per acre.
	zineb	2	15* 30**	WP or D	0.75-1.5	1.6-2	Apply in full schedule from delayed dormant to harvest.	

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CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
APPLE								
Powdery mildew ( <i>Podosphaera</i> <i>leucotricha</i> )	dinocap	Extended	21	WP, LC, or D	0.19-0.25 as WP or 1.9-2.9 oz. as LC	0.4-1.2	Begin when mildew first appears; repeat at week- ly intervals as long as disease threatens.	Do not apply under conditions of extreme heat.
	sulfur	Safe	NTL	WP or D	3.6-7.6	21.0-59.0	Apply from silver tip to third cover or cessation of terminal growth.	
Sooty blotch ( <i>Gloeodes pomigena</i> ) and Fly speck ( <i>Leptothyrium pomi</i> )	captan	25	NTL	WP or D	1* 0.25-1**	1.1-2.1* 1.1-3.75**	Apply in late cover periods.	Red Delicious and other sensitive varieties may be injured by early- season applications.
	captan-zineb	25-2	15*** 30****	WP	0.5 + 0.5	--	Apply in late cover periods.	
	folpet	25	NTL	WP	0.75-1	--	Begin at delayed dormant; repeat at 7-14 day inter- vals through cover spray, except in Western States do not apply between bloom and July 1.	Russetting may be caused on sensitive varieties in Eastern States when used from just before bloom to 30 days after petal fall.
Bitter rot ( <i>Glomerella</i> <i>cingulata</i> )	captan	25	NTL	WP or D	1	2-3.75	Apply in late cover and preharvest periods.	Russetting may be caused on sensitive varieties in Eastern States when used from just before bloom to 30 days after petal fall.
	ferbam	7	7	WP	1.5-2.3	--	Apply in late cover sprays.	
	folpet	25	NTL	WP	0.75-1	--	Begin at delayed dormant; repeat at 7-14 day inter- vals through cover sprays, except in Western States do not apply be- tween bloom and July 1.	

\* Sooty blotch only.

\*\* Fly speck only.

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APPLE								
<u>Blotch</u> ( <u>Phyllosticta</u> <u>solitaria</u> )	ferbam	7	7	WP	0.76-2.3	--	Apply in cover sprays.	Golden Delicious variety easily russetted by ferbam.
	thiram	7	NTL	WP or D	0.98-1.3	1.7-2.6	Begin at prebloom; repeat at bloom and petal fall, and in cover applications.	
	zineb	2	15* 30**	WP or D	0.75-1.5	1.6-2	Apply in full schedule from delayed dormant to harvest.	
<u>Brooks' spot</u> ( <u>Mycosphaerella</u> <u>pomi</u> )	captan	25	NTL	WP or D	0.25-1	1.1-3.75	Apply in cover periods.	
	ferbam	7	7	WP	0.76-1.52	--	Apply in cover sprays.	
	folpet	25	NTL	WP	0.75-1	--	Begin at delayed dormant; repeat at 7-14 day inter- vals through cover sprays, except in Western States do not apply be- tween bloom and July 1.	
<u>Black pox</u> ( <u>Helminthosporium</u> <u>papulosum</u> )	captan	25	NTL	WP or D	1	2-3.75	Apply in late cover and preharvest periods.	Russetting may be caused on sensitive varieties in Eastern States when used from just before bloom to 30 days after petal fall.
<u>Bullseye rot or</u> <u>Perennial canker</u> ( <u>Neofabraea</u> <u>perennans</u> )	captan	25	NTL	WP or D	1	8	Apply in first and second cover sprays or in 1 or 2 preharvest sprays, or as needed at 5-7 day inter- vals from prebloom to early cover periods.	

Continued

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APPLE								
Bullseye rot or Perennial canker ( <u>Neofabraea</u> <u>peremans</u> ) (con.)	ziram	7	7	WP or D	0.75-1.125	7.5	Apply preharvest, before fall rains; repeat if necessary, especially if excessive rainfall occurs.	Pacific Northwest only.
APRICOT								
Brown rot ( <u>Monilinia</u> <u>fructicola</u> )	captan	50	NTL	WP or D	1	5	Apply in red bud, bloom, 75% petal fall, and cover periods.	
	ferbam	7	21	WP	1.14-1.5	--	Apply before, during, and after bloom, and in cover sprays as necessary.	
	maneb	10	14	WP	1.2-1.6	--	Begin at red bud stage; repeat in early bloom, full bloom, and petal fall, and at 7-14 day intervals as necessary up to 2 weeks before harvest.	
Shothole ( <u>Coryneum</u> <u>beijerinckii</u> )	ferbam	7	21	WP	0.76-1.14	--	Apply after harvest; repeat in spring when buds swell, and at shuck shed.	West Coast only.
	maneb	10	14	WP	1.6	--	Apply from dormant through petal fall stages in regular schedule.	
	zineb	7	Do not apply after petal fall	WP	1.5	--	Apply in dormant, red bud, early bloom, full bloom, and petal fall stages, and postharvest before leaves fall.	

Continued

**FRUIT DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
APRICOT								
Shothole ( <i>Coryneum beijerinckii</i> ) (con.)	ziram	7	Do not apply after early cover sprays	WP	1.14-1.52	--	Apply at red bud, early bloom, and full bloom, or under severe conditions repeat at 5-day intervals until full bloom.	
AVOCADO								
Blotch ( <i>Cercospora</i> sp.)	captan	25	NTL	WP	1	--	Use according to State authorities.	
BLACKBERRY								
Anthracnose ( <i>Elsinoe veneta</i> )	captan	25	NTL	WP or D	1	2	Apply in preblossom period when new canes are 6-8 inches long, and in first cover period immediately after petal fall.	
	ferbam	7	40	WP or D	1.14-2.3	5.7	Apply in delayed dormant stage, just before bloom, and at petal fall.	
	lime-sulfur	Safe	NTL	L	6-12	--	Apply in delayed dormant stage.	
Fruit rots ( <i>Elsinoe veneta</i> and <i>Botrytis cinerea</i> )	captan	25	NTL	WP or D	1	0.75-1.5	Apply 3-5 days before harvest starts; repeat at midharvest and 8-10 days later.	

**FRUIT DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
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<b>BLUEBERRY</b>								
Blossom blight ( <i>Botrytis cinerea</i> ), Mummy berry ( <i>Monilinia vaccinii corymbosi</i> ), and Leaf spots ( <i>Phyllostictina vaccinii</i> , <i>Dothichiza caroliniana</i> , and <i>Gloeocercospora inconspicua</i> )	captan	25	NTL	D	--	1	Begin at midbloom; repeat at 7-10 day intervals until maturity.	
	ferbam	7	40	WP or D	1.14-2.3	5.7	Begin just before blossom; repeat at full bloom and 1-3 weeks later.	
					2.3	--	For mummy berry, apply in loose budscale stage; repeat 7 days later.	
	ziram	7	Do not apply later than 3 weeks after full bloom	WP or D	2.28	1.14-2.28	For blossom blight, apply just before bloom, at full bloom, and 2-3 weeks later.	
					--	1-1.5	For leaf spots, apply before fruit forms or after harvest.	
					2.28	1.14-2.28	For mummy berry, apply at loose budscale stage; repeat 7 days later.	

**BOYSENBERRY**

(See Raspberry, Dewberry, and Boysenberry)

<b>CHERRY</b>								
Brown rot ( <i>Monilinia fructicola</i> ) Continued	bordeaux mixture	Exempt	NTL	WP	10 copper sulfate + 10 lime	--	Apply in popcorn to petal fall.	Do not apply to sweet cherries after petal fall.

**FRUIT DISEASES**

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<b>CHERRY</b>								
<b>Brown rot (<i>Monilinia fructicola</i>) (con.)</b>	captan	100	NTL	WP or D	1	--	For blossom blight, apply at 3-4 day intervals during bloom.	
					1-2	1.1-5	For fruit rot, apply in pink, full bloom, petal fall, shuck shed, and cover periods.	
	dichlone	3	3	D	--	1.25	For twig brown rot, begin at pink bud; repeat at full bloom and before shuck shed, or every 4 days in cool, wet weather.	
							For blossom blight, apply at popcorn, full bloom, and petal fall.	
							For fruit rot, apply at 7-10 day intervals from petal fall to 3 days before harvest.	
	folpet	50	NTL	WP or D	1	4.5-6.0	Begin when 10% of blossoms open; continue at 10-14 day intervals until fruit begins to color well.	Folpet should be used on sour cherries only.
	ziram	7	7	WP or D	1.14	2.8-4	Begin when first blooms open; repeat at full bloom and as necessary in cover sprays.	
<b>Leaf spot (<i>Coccomyces hiemalis</i>)</b>	captan	100	NTL	WP or D	1-2	3-4	Apply in pink, bloom, petal fall, and first cover periods, and in 1 or 2 postharvest foliage sprays.	

Continued



**FRUIT DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
CHERRY								
Leaf spot ( <u>Coccomyces hiemalis</u> ) (con.)	folpet	50	NTL	WP or D	1	4.5-6.0	Apply in cover period at 7-14 day intervals until fruit begins to color well. Repeat once or twice in postharvest period.	Folpet should be used on sour cherries only.
	glyodin	5	7	L	1.5-2 pt. of 30% solution	--	Begin at petal fall; repeat at shuck shed, in first and second pre-harvest sprays, and as a postharvest foliar spray.	Glyodin should be used on sour cherries only.
Powdery mildew ( <u>Podosphaera oxycantha</u> )	dinocap	Extended	--	WP or LC	0.125 WP or 1.92 oz. LC	--	Begin when buds begin to break, or when mildew first appears; repeat at 7-10' day intervals.	Dinocap should be used for nonbearing nursery stock only. Do not graze treated orchards.
Botrytis rot ( <u>Botrytis cinerea</u> )	captan	100	NTL	WP or D	1-2	6	Apply at petal fall, at shuck shed, and in cover sprays.	
CITRUS *								
Anthraco-nose ( <u>Gloeosporium limeticola</u> and <u>Colletotrichum gloeosporioides</u> )	ferbam	7	NTL	WP	1.14-2	--	Apply in prebloom period, at two-thirds petal fall, and in late summer or early fall if heavy flush of growth occurs.	

\* Grapefruit, kumquat, lemon, lime, orange, tangelo, and tangerine.

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**FRUIT DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
<b>CITRUS</b>								
Greasy spot ( <u>Cercospora</u> sp.)	zineb	7	NTL	WP or D	0.75-1.0	1.6-2	Begin when young fruit is 0.5 inch in diameter; repeat as needed.	
Brown rot ( <u>Phytophthora</u> <u>citrophthora</u> )	bordeaux mixture	Exempt	NTL	--*	6 copper sulfate + 6 lime	--	Spray ground under trees and the lower branches up to 3 feet above the soil just before first rains or as soon there- after as possible.	
<b>CRANBERRY</b>								
Fruit rots ( <u>Sporonema oxycocci</u> , <u>Fusicoccum</u> <u>putrifaciens</u> , and <u>Diaporthe vaccinii</u> )	ferbam	7	Do not apply later than 28 days after midbloom	WP or D	1.14-6.84 lb./ 25- 100 gal./ acre- by ground equipment  6.84 lb./ 13 gal./ acre - by air- craft	2.9-5.7	Begin at mid-bloom; repeat once or twice at 2- week intervals.	
	folpet	25	30	WP	--	4.5 in enough water to cover	Begin at bloom; repeat at 10-14 day intervals.	

Continued

\* Does not apply.

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Use Pesticides Safely—Follow the Label

**FRUIT DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
<b>CRANBERRY</b>								
Fruit rots ( <u>Sporonema oxycocci</u> , <u>Fusicoccum</u> <u>putrifaciens</u> , and <u>Diaporthe vaccinii</u> ) (con.)	maneb	7	30	WP or D	1.6-2.4	3-6	For Massachusetts, begin at midbloom; repeat 3 times at 10-14 day inter- vals.	
					1.6	--	For New Jersey and Wisconsin, begin after midbloom; repeat 10-14 days later, 4 weeks after midbloom, and 2-3 weeks later.	
	zineb	7	Do not apply after midbloom	WP or D	1.5-2.25	1.5-3	Apply at 5% bloom; repeat at midbloom.	
Twig blight ( <u>Lophodermium</u> sp.)	captan	25	NTL	WP	1	--	Begin about July 19; repeat in early and in late August.	
	maneb	7	30	WP	1.6	--	For Washington and Oregon, begin after blooming; repeat between July 10-20, August 1-10, and August 10-25.	
<b>CURRENT AND GOOSEBERRY</b>								
Fruit rot ( <u>Botrytis cinerea</u> )	ferbam	7	14	WP or D	0.76-1.5	1.7-2.9	Begin in prebloom stage; repeat at postbloom, 2 weeks later, and after harvest.	

# FRUIT DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
CURRENT AND GOOSEBERRY								
Leaf spot ( <i>Mycosphaerella</i> <i>ribis</i> )	bordeaux mixture	Exempt	NTL	---	3 copper sulfate + 3 lime	--	Apply 2-3 weeks after bloom, or about the time the first few lower leaves in center of bushes show signs of lesions or spots. Sub- sequent sprays, generally in postharvest period, will prevent secondary spread of disease.	
	ferbam	7	14	WP or D	0.76-1.5	1.7-2.9	Begin in prebloom stage; repeat at postbloom, 2 weeks later, and after harvest.	
DEWBERRY								
(See Raspberry, Dewberry, and Boysenberry)								
GOOSEBERRY								
(See Currant and Gooseberry)								
GRAPE								
Black rot ( <i>Guignardia bidwellii</i> )	captan	50	NTL	WP or D	1	1.1-2.1	Make two applications before blossoming and 3 or 4 applications at 10- 15 day intervals after bloom.	

Continued

\* Does not apply.

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**FRUIT DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
<b>GRAPE</b>								
<b>Black rot</b> <b>(<i>Guignardia bidwellii</i>)</b> <b>(con.)</b>	ferbam	7	7	WP or D	0.76-1.52	1.7-2.9	Apply just before bloom, just after bloom, and 2 weeks before berries touch.	May cause injury during hot, dry weather.
	folpet	25	NTL	WP or D	1	3	Apply 250-300 gal. per acre, begin just before bloom; repeat just after bloom and at 7-10 day intervals for 1-3 more applications.	
	zineb	7	7	WP or D	1.125-1.5	0.8-3	Apply just before bloom; repeat just after bloom, 10 days after bloom, and 2-3 weeks later, or at 10-14 day intervals.	
<b>Dead arm</b> <b>(<i>Cryptosporella</i></b> <b><i>viticola</i>)</b>	captan	50	NTL	WP	2	—	In Northeastern States, begin when new shoots are 1-2 inches long; repeat when 4-6 inches long. In California, begin when new shoots are 6-8 inches long; repeat 2 weeks later and again before bunches close.	During periods of extended hot, dry weather, foliage injury may occur.
	folpet	25	NTL	WP	1	—	In Eastern States, begin when new growth is 1-2 inches long; repeat when 8-10 inches long. In Western States, begin at bud break; repeat 2 weeks later, or when new growth is 4-8 inches long.	

**FRUIT DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
<b>GRAPE</b>								
<b>Downy mildew</b> <b>(<i>Plasmopara viticola</i>)</b>	bordeaux mixture	Exempt	NTL	---*	6 copper sulfate + 6 lime	--	Begin when new growth is 1/2 inch long; repeat at 2-week intervals.	
				WP	16-20 of 12.75% copper in WP formulation	--		
	captan	50	NTL	WP or D	1	1.1-2.1	Make two applications before blossoming and 3 or 4 applications at 10-15 day intervals after bloom.	
	folpet	25	NTL	WP	1	--	Apply 250-300 gal. per acre. Begin just before bloom; repeat just after bloom, and at 7-10 day intervals for 1-3 more applications.	During periods of extended hot, dry weather, foliage injury may occur.
	zineb	7	7	WP or D	1.125-1.5	0.8-3	Apply just before bloom; repeat just after bloom, 10 days after bloom, and 2-3 weeks later, or at 10-14 day intervals.	
<b>Powdery mildew</b> <b>(<i>Uncinula necator</i>)</b>	dinocap	Extended	21	WP	--	0.57	On varieties susceptible to powdery mildew and tolerant of sulfur, 2-3 sprays before flowering and 1 after will generally control powdery mildew throughout the season.	
	wettable sulfur	Safe	NTL	WP or D	4-6	5-10	Programs for black rot and downy mildew using bordeaux mixture, captan, zineb, or folpet usually control powdery mildew.	During periods of hot weather, foliage injury may occur.

\* Does not apply.

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					PER 100 GAL.	PER ACRE		
GRAPE								
Bitter rot ( <u>Melanconium</u> <u>fuligineum</u> )	(See Safety Precautions or Restrictions)						In vineyards where bitter rot is severe, apply bordeaux mixture (4-4- 100) a month before harvest and a spray of captan or zineb 2 weeks later.	If spray schedule for control of black rot is followed, this disease usually does not become a problem.
Anthrachnose or Bird's eye rot ( <u>Elsinoe ampelina</u> )	lime-sulfur	Safe	NTL	L	2 qt. of 26-31% suspension	--	Apply during dormant season, then 4 or 5 applications of bordeaux mixture (4-4-100) or ferbam (2 lb.) in growing season.	
NECTARINE								
Brown rot ( <u>Monilinia fructicola</u> and <u>M. laxa</u> )	captan	50	NTL	WP or D	1	5	Apply in pink, petal fall, and cover periods.	
	ferbam	7	Do not apply later than immediate- ly after bloom	WP or D	0.76-1.14	5.7	Apply before, during, and immediately after bloom.	
	maneb	10	14	WP	1.6	--	Begin at red bud; repeat in early bloom, full bloom, and petal fall, and at 7-14 day intervals up to 2 weeks before harvest.	

Continued

FRUIT DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
NECTARINE								
Brown rot ( <u>Monilinia fructicola</u> and <u>M. laxa</u> ) (con.)	wettable sulfur	Safe	NTL	WP or D	3.75-9.7	12.5-60	Apply in pink bud, full bloom, and covers as long as necessary.	<u>Monilinia laxa</u> is important mainly on the West Coast. Do not spray during hot weather because injury may occur.
	zineb	7	40	WP or D	1.125	1.6.2	Apply in postharvest or dormant periods, and in popcorn to petal fall.	
	ziram	7	NTL	WP	1.14-1.52	--	Apply at pink bud, 25- 75% of full bloom, petal fall, and cover stages.	
Scab ( <u>Cladosporium</u> <u>carpophilum</u> )	captan	50	NTL	WP or D	1	5	Apply in pink, petal fall, and cover periods.	Remove excess residues by wiping or brushing.
	zineb	7	40	WP or D	1.125	1.6-2	Apply in postharvest or dormant periods, and in popcorn to petal fall.	
Powdery mildew ( <u>Podosphaera</u> <u>oxyacanthae</u> and <u>Sphaerotheca pannosa</u> )	wettable sulfur	Safe	NTL	WP or D	3.75-9.7	12.5-60	Apply in pink, bloom, and early petal fall, 2 weeks later, and in beginning of pit hardening.	Do not spray during or just before hot weather, because injury may occur.
Leaf curl ( <u>Taphrina deformans</u> )	bordeaux mixture	Exempt	NTL	WP	10 copper sulfate + 10 lime	--	Dormant to popcorn stages.	
	zineb	7	40	WP or D	1.125	1.6-2	Apply in postharvest or dormant periods and in popcorn to petal fall.	



**FRUIT DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
<b>NECTARINE</b>								
<b>Coryneum blight (<i>Coryneum beijerinckii</i>)</b>	bordeaux mixture	Exempt	NTL	WP	10 copper sulfate + 10 lime	--	Late fall application.	
	captan	50	NTL	WP or D	1	5	Apply in pink bud, petal fall, and cover periods, and in late fall.	
	maneb	10	14	WP	1.6	--	Begin at red bud; repeat in early bloom, full bloom, and petal fall, and at 7-14 day intervals up to 2 weeks before harvest.	
	zineb	7	40	WP or D	1.125	1.6-2	Apply in postharvest or dormant periods and in popcorn to petal fall.	
<b>PEACH</b>								
<b>Brown rot (<i>Monilinia fructicola</i>)</b>	captan	50	NTL	WP or D	1	5 *	Apply in pink, full bloom, shuck shed, cover, and preharvest periods. For brown rot (blossom blight), apply at 3-4 day intervals during bloom.	
	dichlone	3	7	WP or D	--	2.5	Apply at pink bud, full bloom, and just before shuck fall. For fruit rot, use same dosage in preharvest spray.	
	ferbam	7	21	WP or D	1.14-1.52	3-4.6	Apply before, during, and after bloom; repeat as necessary.	

Continued

\* At 6lb. per acre, do not apply within 1 day of harvest.

Use Pesticides Safely—Follow the Label

**FRUIT DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
<b>PEACH</b>								
<b>Brown rot (<i>Monilinia fructicola</i>) (con.)</b>	liquid lime- sulfur	Safe	NTL	L	2 qt. of 27.5-31% solution	--	Apply 3-5 times at weekly intervals before harvest.	May cause "sunburn" if applied when temperature is above 85° F.
					1 pt. of 29-31% solution/ 8-16 gal.	--	For brown rot (blossom blight), apply in pre- bloom, early bloom, and full bloom stages.	
	maneb	10	2	WP	1.6	--	Begin at red bud; repeat in early bloom, full bloom, and petal fall and at 7-14 day intervals up to 2 weeks before harvest.	If applied within 14 days of harvest, remove residues by brushing.
	thiram	7	7	WP or D	0.98-1.3	1.96	Begin at pink stage; repeat at 3-4 day inter- vals during bloom for blossom blight, and at petal fall and cover applications for fruit rot.	
	wettable sulfur	Safe	NTL	WP or D	3.75-9.7	12.5-60	Apply at pink, bloom, petal fall, shuck split, and shuck fall stages, and at 10-14 day inter- vals as long as necessary. For brown rot of fruit, apply when fruit begins to ripen.	May cause "sunburn" if applied when tempera- ture is above 85° F.
	zineb	7	30	WP or D	1.125	1.6-2	Apply in popcorn to petal fall.	
	ziram	7	NTL	WP	1.14-1.52	--	Apply in pink bud, 25- 75% of full bloom, petal fall, and cover stages.	Remove excess residues by brushing or wiping.

**FRUIT DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
PEACH								
<u>Scab</u> ( <u>Cladosporium</u> <u>carpophilum</u> )	captan	50	NTL	WP or D	1	5 *	Apply in pink, full bloom, shuck shed, cover, and preharvest periods.	If disease is very severe, four sprays may be necessary.
	wettable sulfur	Safe	NTL	WP or D	3.75-9.7 dry material in 3 sprays	12.5-60	First application in shuck fall period and the other two at 10-day intervals.	
	zineb	7	30	WP or D	1.125	1.6-2	Apply in popcorn to petal fall.	
<u>Powdery mildew</u> ( <u>Podosphaera</u> <u>oxyacanthae</u> and <u>Sphaerotheca pannosa</u> )	dinocap	Extended	45	WP, LC, or D	0.125-0.19 WP or 1.92 oz. LC	0.07-0.1	Begin at pink bud stage; repeat at petal fall, at shuck shed, in early cover sprays, and as a postharvest foliage spray.	
	wettable sulfur	Safe	NTL	WP or D	3.75-9.7	12.5-60	Apply in shuck fall through third cover.	
<u>Bacterial spot</u> ( <u>Xanthomonas pruni</u> )	dodine-captan	5-50	15	WP	0.325 dodine + 0.5 captan	--	Begin at shuck split; repeat at 7-10 day intervals in cover period, more frequently during wet weather.	Bacterial spot control with this combination is effective under only light to moderate disease conditions. Do not combine dodine and captan with solvent formulations of insecticides or sulfur.
	zinc sulfate	30 as metallic zinc	NTL	WP	1.6	--	Apply at petal fall and shuck split or according to State agricultural authorities.	

\* At 6 lb. per acre, do not apply within 1 day of harvest.

**FRUIT DISEASES**

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					PER 100 GAL.	PER ACRE		
PEACH								
Leaf curl ( <u>Taphrina deformans</u> )	bordeaux mixture	Exempt	NTL	WP	20-40 of prepared WP or 10 copper + 10 lime	--	In fall or spring before buds swell.	
	dichlone	3	7	WP	0.5	--	In dormant period just before buds begin to swell.	
	ferbam	7	21	WP	2.3	--	In Western States, in fall after leaves drop; repeat in dormant early spring period.	
					0.76-1.14	--	In Eastern States, in one dormant season applica- tion.	
	liquid lime- sulfur	Safe	NTL	L	10-12 gal./ 100 gal. spray	--	In fall or in spring before buds swell.	
	maneb	10	2 (See Safety Precautions or Restric- tions)	WP	1.2-1.6	--	Apply in spring dormant period.	If applied within 14 days of harvest, remove residues by brushing.
	zineb	7	30	WP or D	1.125	1.6-2	Apply in postharvest or dormant periods and in popcorn to petal fall.	
	ziram	7	NTL	WP or D	1.125-2.25	3-4	In dormant and popcorn stage. For West Coast, apply just before fall rains or in November and repeat in 3 months while trees are still dormant and again in popcorn stage.	Remove excess residues by wiping or brushing.

FRUIT DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
PEACH								
<u>Coryneum blight</u> ( <u>Coryneum</u> <u>beijerinckii</u> )	bordeaux mixture	Exempt	NTL	WP	10 copper sulfate + 10 lime	--	Apply only during and after leaf fall.	Never apply copper sprays to peach trees during growing season.
	captan	50	NTL	WP	1	--	Apply in pink bud, full bloom, petal fall, and cover periods.	
	dichlone	3	7	WP	--	1.87	Apply between September 15-30 in Oregon and Washington.	
	maneb	10	2 (See Safety Precautions or Restric- tions)	WP	1.2-1.6	--	Begin at red bud; repeat in early bloom, full bloom, petal fall, and at 7-14 day intervals up to 2 weeks before harvest.	If applied within 14 days of harvest, remove residues by brushing.
	zineb	7	30	WP or D	1.125	1.6-2	In postharvest or dormant periods, and in popcorn to petal fall.	
PEAR								
<u>Scab</u> ( <u>Venturia pirina</u> )	captan	25	NTL	WP or D	1	2-3	Primary infection: apply in pink, petal fall, and first two cover periods.	Do not use on d'Anjou pears. Russetting may be produced on Bosc pears.
	dodine	5	7	WP or D	0.49	0.8-1.2	Secondary infection: apply in cover periods.  Begin in prebloom stages; repeat at 5-7 day intervals through first cover spray.	

Continued

**FRUIT DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
PEAR								
Scab ( <i>Venturia pirina</i> ) (con.)	dodine	5	7	WP or D	0.325-0.49	--	Use in subsequent sprays (in Western States only).	
	ferbam	7	7	WP or D	0.7-1.52	1.9-3	Apply in pink and calyx stages and through second cover.	
	glyodin	5	NTL	WP	0.525 oz.	--	Begin at delayed dormant stage; repeat at prepink, pink, bloom, and petal fall stages, and in cover sprays.	
Fire blight ( <i>Erwinia amylovora</i> )	bordeaux mixture	Exempt	NTL	WP	1 of 12.5 % copper in dry mix formulation	--	Apply when first blooms start to open and through third cover.	May cause russetting of fruit.
	streptomycin	0.25	30	WP or D	0.5-1.0 of 8.5% WP or 0.25-0.5 of 17% WP	--	Spray trees at 10% of bloom; repeat at 3-5 day intervals until bloom is over. To control twig blight, continue sprays at 5-14 day intervals or 1500 ppm (40 lb.) of 0.15% dust per acre.	60 ppm spray at 600 gal. per acre and 1500 ppm dust for use in West Coast area only. 50- 100 ppm at 600 gal. per acre suggested for use in other parts of the country.
	zineb	7	7	WP	1.5	--	Apply at 10% bloom, full bloom, and petal fall, or at 2-3 day intervals during blooming.	
Powdery mildew ( <i>Podosphaera</i> <i>leucotricha</i> )	dinocap	Extended	21	WP, LC, or D	0.19-0.25 lb. as WP or 1.9-2.9 oz. as LC	0.4-0.5 D	Apply at delayed dormant stage; repeat at 7-14 day intervals as necessary.	

Continued

FRUIT DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
PEAR	wetable sulfur	Safe	NTL	WP or D	3.8-7.6	8-60	Apply as prebloom and early postbloom sprays.	Do not apply when temperature is above 85° F.
Powdery mildew ( <i>Podosphaera</i> <i>leucotricha</i> ) (con.)								
Sooty blotch ( <i>Gloeodes pomigena</i> ) and Fly speck ( <i>Leptothyrium pomi</i> )								
Bullseye rot or Perennial canker ( <i>Neofabraea</i> <i>perennans</i> )								
Leaf blight ( <i>Fabraea maculata</i> )								
PLUM AND PRUNE	ferbam	7	7	WP	0.76-1.14	--	Apply in fall after harvest and before leaf drop; repeat in spring as buds swell.	
Leaf spot ( <i>Coccomyces</i> spp.)								
Brown rot ( <i>Monilinia fructicola</i> )								
	captan	50	NTL	WP or D	1	2-5	Apply at red bud, 75% bloom, petal fall, and in covers as necessary.	

FRUIT DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
PRUNE								
(See Plum and Prune)								
QUINCE								
Rust ( <u>Gymnosporangium clavipes</u> )	captan + zineb + sulfur	25 7 Exempt	40	D D D	-- -- --	2.1 + 2.1 + 12.5	Apply at prebloom and petal fall; repeat at 10-14 day intervals.	
Leaf blight ( <u>Fabraea maculata</u> )	ferbam	7	7	WP	0.76-1.14	--	Apply in pink and petal fall stages, and in cover sprays.	
Bitter rot ( <u>Glomerella cingulata</u> )	captan + zineb + sulfur	25 7 Exempt	40	D D D	-- -- --	2.1 + 2.1 + 12.5	Apply in prebloom period; repeat at petal fall and at 10-14 day intervals.	
Brown rot ( <u>Monilinia fructicola</u> )	captan + zineb + sulfur	25 7 Exempt	40	D D D	-- -- --	2.1 + 2.1 + 12.5	Begin when disease threatens; repeat at 7-10 day intervals.	
Scab ( <u>Venturia pirina</u> )	captan	25	7	WP or D	5	5	Begin when disease threatens; repeat at 7-10 day intervals.	



FRUIT DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
RASPBERRY, DEWBERRY, AND BOYSENBERRY								

(Apply sprays recommended for Blackberry diseases)

STRAWBERRY								
Fruit rots ( <i>Botrytis cinerea</i> , <i>Pezizella lythri</i> , <i>Rhizoctonia</i> sp., <i>Phytophthora</i> <i>cactorum</i> , <i>Mycosphaerella</i> <i>fragariae</i> , and <i>Gnomonia fructicola</i> )	anilazine	10	5	WP or D	1-1.5	1-2	Begin early in growing season and continue at about 10-day intervals.	
	captan	25	NTL	WP or D	1.5	3	Begin at new growth; repeat at 7-day intervals through picking.	When foliage is wet, dusts are most effective.
	thiram	7	(See Safety Precautions or Restrictions)	WP or D	1.3-1.63	1.75-2.6	Begin at early blossom stage; repeat at 10-day intervals as necessary.	Remove residues by washing if applications are made within 3 days of picking.
	zineb	7	7	WP or D	1.125-1.5	0.8-2.4	Begin when new growth starts; repeat at 10-day intervals.	
Leaf spots ( <i>Mycosphaerella fragariae</i> ) and Leaf scorch ( <i>Diplocarpon earliana</i> )	bordeaux mixture	Exempt	NTL	WP  --*	12-14 of 12.75% copper formulation or 8 copper sulfate + 8 lime	--  --	Apply when new growth starts in spring; maintain protective cover sprays to harvest.	In moist, coastal area spray in summer with bordeaux mixture 6-6-100 and maintain protective cover spray on plants until berries are one-third grown. Apply final bordeaux mixture at 8-8-100 before fall rains when the disease has been troublesome.

Continued

\* Does not apply.

Issued December 1972

**FRUIT DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
<b>STRAWBERRY</b>								
Leaf spots ( <u>Mycosphaerella</u> <u>fragariae</u> ) and Leaf scorch ( <u>Diplocarpon earliana</u> ) (con.)	captan	25	NTL	WP or D	1.5	3	Begin at new growth stage; repeat at 7-day intervals through picking.	
	dodine	5	14	WP or D	1-1.3/ 200-300 gal./acre	1-1.3	Begin when new growth starts; repeat at weekly intervals.	
Powdery mildew ( <u>Sphaerotheca</u> <u>macularis</u> )	wettable sulfur	Safe	(See Safety Precautions or Restric- tions)	WP or D	1.8-4.9	3-50	Begin with first sign of disease; repeat as necessary.	Discontinue sulfur applications well before harvest. May injure strawberries under certain climatic conditions.

FRUIT AND VEGETABLE POSTHARVEST DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
APPLE								
Blue mold ( <i>Penicillium</i> spp.)	SOPP	25	--	L or water soluble salt	0.3-3.16% solution	--	Postharvest as dip, wash, foam, or spray.	Fruit usually rinsed after treat- ment to avoid injury.
Storage scald (physiological)	ethoxyquin	3	--	Emulsion: 2 or 3 pints 70% formu- lation per 100 gal.	1800-2700 ppm	--	Within a few days after harvest as 10-15 second dip as spray or drench of field boxes with a drip- type brush applicator.	Coverage improved when fruit and emulsion are warm.
	ethoxyquin	3	--	3 pints 70% formulation per 100 gal.	2700 ppm	--	Preharvest spray day before harvest.	Control not as good as obtained with postharvest treat- ments. Often injures fruit.
	diphenylamine (DPA)	10	--	83% WP or LC	2000 ppm	--	Within a few days after harvest as 10-15 second dip as spray or drench of field boxes with drip- type brush applicator.	Concentrations over 1000 ppm will severely injure Rome Beauty apples.
	diphenylamine (DPA)	10	--	Mineral oil wraps con- taining 1.5 mg DPA	--	--	Apply within 2-3 days after harvest.	
	diphenylamine (DPA)	10	--	83% Wettable powder or liquid concentrate	2000 ppm	--	Spray applied 1 or 2 days before harvest.	Control not as good as that obtained with dips, drenches, or wraps.

**FRUIT AND VEGETABLE POSTHARVEST DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
CARROT, CELERY, PEPPER, POTATO, AND TOMATO								
Bacterial soft rot ( <u>Erwinia carotovora</u> )	calcium hypo- chlorite	--	--	P	100-120 ppm	--	Postharvest dip.	
CHERRY								
Blue mold ( <u>Penicillium</u> spp.), Brown rot ( <u>Monilinia</u> <u>fructicola</u> ), and Rhizopus rot ( <u>Rhizopus stolonifer</u> )	benomyl	15	--	50% WP	0.25 lb.	--	Postharvest dip or spray to wet fruit as soon as possible after harvest.	Will not control Rhizopus rot.
	captan	100	--	50-80% WP	0.12% suspension	--	Postharvest, in sizing machine.	
	SOPP	5	--	L or water soluble salt	0.5-1.0% solution	--	Postharvest flood or spray.	Rinse to avoid injury.

FRUIT AND VEGETABLE POSTHARVEST DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
CITRUS (Arizona-California)							
(Grapefruit, oranges, and lemons) Penicillium blue and green molds ( <u>Penicillium italicum</u> and <u>P. digitatum</u> )	biphenyl	110	--	Paper pads impregnated with: 25% biphenyl 50% paraffin 24% mineral oil 1% lemon oil	4 lb. biphenyl per 1,000 sq. ft. impregnated pads. Apply 2 pads (10 9/16" x 16 1/4") impregnated with 2.35 g. biphenyl each, to each standard 4/5 bu. carton. Two pads contain 4.7 g. biphenyl at time of manufacture	Apply 2 pads to citrus fiberboard carton at time of packing, 1 pad near top and 1 near bottom of each carton.	
	SOPP and OPP	10 (expressed as OPP)	--	WP	0.5% in water solution	Use SOPP in wash solution adjusted and maintained at pH 11.8-12.0. Soak fruit 1-2 but not over 3 minutes. Rinse copiously with clean water. Often used in conjunction with soap wash solutions.	Do not use on lemons that are to be stored because biphenyl-tolerant strains of <u>P. digitatum</u> may develop. Hexamine is not recommended to be added to SOPP solutions in Arizona and California.
					2% foam	Sometimes SOPP foam wash is applied to lemons on removal from storage.	Effectiveness of this form of application is sometimes questioned.
					1% wax emulsion; 1 gal./10,000 lb. of fruit	Use 0.8% OPP or 1.0% SOPP in shipping wax. Apply wax to fruit before shipping and buff with soft brushes.	Do not use in wax applied to lemons going into storage because biphenyl-tolerant strains of <u>P. digitatum</u> may develop.

FRUIT AND VEGETABLE POSTHARVEST DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
CITRUS (Arizona-California)							
(Grapefruit, oranges, and lemons) Brown rot ( <i>Phytophthora</i> spp.)	bordeaux mixture	Exempt	--	12.75% metallic copper equivalent plus excess calcium hydroxide (Dry)	3 lb. CuSO <sub>4</sub> pentahydrate, 3 lb. hydrated lime in 100 gal. water	Apply to trees before and during rainy or damp periods as a spray to lower trunks and lower leaves and fruit (3-4 ft. from ground).	Not listed in Official List of FDA Tolerances. Listed in EPA Summary of Reg. Agr. Pesticide Chemical Uses as Exempt. The copper in bordeaux mixture may cause tree injury.
	captan	25	--	WP	4 lb. actual in 100 gal. water 10 lb. actual per acre  0.12% water solution	Same as bordeaux mixture, or as postharvest dip or spray.  Citrus can be given a postharvest dip or spray in a 0.12% solution.	Do not feed raw citrus by-products that have been treated with captan to dairy animals or to animals being finished for slaughter.
(Lemons) Alternaria rot ( <i>Alternaria citri</i> )	2,4-D	5 (Includes residues from both postharvest and pre-harvest use)	--	Isopropyl ester	250-500 ppm in storage (water) wax or as a water solution in which fruit is immersed before waxing	Usually applied to fruit just before it is stored but can also be applied to trees as a preharvest spray to reduce fruit drop and Alternaria rot.	

**FRUIT AND VEGETABLE POSTHARVEST DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
<b>CITRUS (Florida)</b>							
(Grapefruit, limes, oranges, tangerines, tangelos, citron, kumquats, and hybrids of these)	biphenyl	110	--	Impregnated paper pads (11" x 17") each containing 2.35 g.	--	Apply 2 pads per 4/5-bu. box at time of packing.	Grapefruit and oranges only.
Stem-end rot ( <i>Phomopsis citri</i> or <i>Diplodia natalensis</i> ),	OPP	10	--	0.8% in solvent wax	--	Postharvest, before packing.	
Green-mold rot ( <i>Penicillium digitatum</i> ),	SOPP	10 (expressed as OPP)	--	2% in water with caustic, with or without hexamine	--	Postharvest dip, flood, or spray for 2 minutes, followed by fresh-water rinse.	Maintain pH between 11.5 and 12.2
Blue-mold rot ( <i>P. italicum</i> ),			--	1% in water-wax emulsion	1 gal./5,000-10,000 lb. fruit	Postharvest, before packing.	Combination SOPP treatments may exceed tolerance.
Black rot ( <i>Alternaria citri</i> ),							
Anthracnose ( <i>Colletotrichum gloeosporioides</i> ), and other decays							
(Lemons) Black rot ( <i>Alternaria citri</i> )	2,4-D	5	--	500 ppm isopropyl ester in water spray or water-wax emulsion	--	To extend shelf life by preserving green buttons, and control <i>Alternaria</i> rot.	

**FRUIT AND VEGETABLE POSTHARVEST DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
<b>PEACH AND NECTARINE</b>								
<b>Brown rot (<i>Monilinia fructicola</i>)</b>	benomyl	15	--	50% WP	0.25 lb.	--	Postharvest dip, drench or spray to wet fruit as soon as possible after harvest.	
	captan	50	--	50-80% WP	0.12% suspension	--	Postharvest dip, drench or spray.	
	DCNA	20	--	Peaches: 50 or 75% WP	0.75%	--	Postharvest dip, drench or spray.	
		20	--	50 or 75% WP	2 lb.	--	Postharvest peaches during ripening before freezing or canning.	
		20	--	Nectarines: wax emulsion	2 lb./100 gal. water with wax	--	Postharvest spray 30-35 gal./hr at 18-30 psi during packing.	
	SOPP	20	--	Water soluble salt	0.64-1.0% solution	--	Postharvest dip, drench or spray.	Rinse fruit to avoid injury.
		20	--	Peaches only: wax emulsion	0.2%	--	Postharvest 1 gal./680 lb. fruit.	Do not rinse.
<b>Rhizopus rot (<i>Rhizopus stolonifer</i>)</b>	DCNA	20	--	Peaches: 50 or 75% WP	0.75%	--	Postharvest dip, drench or spray.	
		20	--	50 or 75% WP	2 lb.	--	Postharvest peaches during ripening before freezing or canning.	
		20	--	Nectarines: wax emulsion	2 lb./100 gal. water with wax	--	Postharvest spray 30-35 gal./hr at 18-30 psi during packing.	
	SOPP	20	--	Water soluble salt	0.64-1.0% solution	--	Postharvest dip, drench or spray.	Rinse fruit to avoid injury.
		20	--	Peaches only: wax emulsion	0.2%	--	Postharvest 1 gal./680 lb. fruit.	Do not rinse.



**FRUIT AND VEGETABLE POSTHARVEST DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
PEAR								
Blue mold ( <u>Penicillium</u> spp.)	captan	25	--	80% WP	0.12% suspension	--	Postharvest, in washer.	Fruit must be rinsed to avoid injury.
	SOPP	25	--	22% L	0.3-1.86% solution	--	Postharvest dip in dump water, or as foam.	
PEAR (Anjou)								
Storage scald (physiological)	ethoxyquin	3	--	Emulsion 3 pints 70% formulation per 100 gal.	2700 ppm	--	Within 48 hours after harvest as a 15-second dip.	Poor control of scald; brown spots develop on calyx- end of fruit.
	ethoxyquin	3	--	Mineral oil wraps contain- ing 2.5 mg. ethoxyquin per wrap	--	--	Apply after harvest.	
	ethoxyquin	3	--	Emulsion 2 or 3 pints 70% formulation per 100 gal.	1800- 2700 ppm	--	Spray 1 or 2 days before harvest.	
PLUM								
Brown rot ( <u>Monilinia fructicola</u> )	benomyl	15	--	50% WP	0.25 lb.	--	Postharvest dip, drench or spray to wet fruit as soon as possible after harvest.	
	captan	50	--	50-80% WP	0.12% suspension	--	Postharvest dip, drench or spray.	

**FRUIT AND VEGETABLE POSTHARVEST DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
<b>RADISH</b>								
Bacterial black spot ( <u>Xanthomonas</u> <u>vesicatoria</u> var. <u>raphani</u> )	calcium hypochlorite	--	--	P	25 ppm	--	Postharvest dip.	
<b>SWEETPOTATO</b>								
Rhizopus rot ( <u>Rhizopus stolonifer</u> )	DCNA	10	--	Wax emulsion	1000 ppm actual as wax	--	Postharvest foam or flooding 1 gal. to no less than 800 lb. sweetpotatoes.	
	SOPP	15	--	Water soluble salt	30 second dip in 0.5- 1.0% solution	--	Postharvest on removal of roots from storage or before packaging.	Do not use on freshly harvested roots. Rinse with fresh water to avoid injury. Concentrated SOPP reduced to 0.2% when roots treated in 120-125° F water.
Black rot ( <u>Endoconidiophora</u> <u>fimbriata</u> )	DCNA	10	--	50-75% WP	Dip or spray con- taining 0.75 lb./ 100 gal. DCNA	--	Postharvest on removal from storage or before packaging.	

## GRASS SEED CROP DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	OUNCES OF ACTIVE INGREDIENT TO APPLY PER 1,000 SQ. FT. UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
GRASSES GROWN FOR SEED							
Rusts ( <u>Puccinia</u> <u>striiformis</u> )	maneb	Nonfood use		WP	1.6-2.4 lb./acre	Begin when rust pustules are first seen; repeat at 7-14 day intervals.	Do not graze treat- ed areas. Do not feed clippings to livestock.
( <u>Puccinia</u> <u>poae-nemoralis</u> and ( <u>Puccinia graminis</u> )	nickel sulfate- maneb	Nonfood use		WP	3-4.5 lb. of formulation/acre	Three to four foliage spray applications. Start about April 15-20 or when rust is first noticed. Repeat at 2- week intervals through May if needed.	Do not graze treat- ed fields or use straw or crop wastes for live- stock feed.
Range grasses: <u>Agropyron</u> spp. <u>Bromus</u> spp. <u>Elymus</u> spp. <u>Festuca</u> spp. Seed treatment to control infection by <u>Podosporiella</u> <u>verticillata</u>	captan	Nonfood use		WP D	2.2-9/100 lb. 6/100 lb.	Seed treatment.	Do not use treated seed for food, feed, or oil purposes.
	thiram	Nonfood use		WP D	3.7-4/100 lb. 4/100 lb.	Seed treatment.	Do not use treated seed for food, feed, or oil purposes.
Pearl millet ( <u>Pennisetum</u> <u>typhoides</u> ); Kernel smut ( <u>Tolyposporium</u> <u>penicillariae</u> ), Seed decay, and Damping-off organisms	thiram	Nonfood use		WP D	1.8-2/100 lb. 3/100 lb.	Seed treatment.	Do not use treated seed for food, feed, or oil purposes.

## GRASS SEED CROP DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	OUNCES OF ACTIVE INGREDIENT TO APPLY PER 1,000 SQ. FT. UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
<b>GRASSES GROWN FOR SEED</b>							
Sorghum and sorghum x sudan hybrids Seed decay and Damping-off organisms	captan	Nonfood use		WP D	0.8-2.3/100 lb. 0.5-3/100 lb.	Seed treatment.	Do not use treated seed for food, feed, or oil purposes.
	thiram	Nonfood use		WP D	1.7-1.8/100 lb. 1.3/100 lb.	Seed treatment.	Do not use treated seed for food, feed, or oil purposes.
Grass seed miscellaneous Seed decay and Damping-off organisms	captan	Nonfood use		WP D	2.2-9/100 lb. 6/100 lb.	Seed treatment.	Do not use treated seed for food, feed, or oil purposes.
	thiram	Nonfood use		WP D	3.7-4/100 lb. 4/100 lb.	Seed treatment.	Do not use treated seed for food, feed, or oil purposes.

## OILSEED AND INDUSTRIAL CROP DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
FLAX								
Pasmo ( <u>Mycosphaerella linorum</u> ), Damping-off and seed decay	captan	Nonfood use	--*	WP or D	--	1.9 oz./ 100 lb. SL or 2.7 oz./ 100 lb. D	Seed treatment only.	Do not use treated seed for food, feed, or oil.
HOPS								
Downy mildew ( <u>Pseudoperonospora humuli</u> )	streptomycin	Extended	Do not apply after first vine training	WP	--	1000 ppm	Apply to hop crown when shoots first appear; re- peat after crown pruning. Wet all foliage and open crown areas to point of runoff.	
	zineb	60	14	WP or D	1.125-1.5	1.1-3.0	Apply 100-200 gal./acre according to foliage density at weekly inter- vals after growth starts.	
MINT								
Verticillium wilt ( <u>Verticillium albo-atrum</u> )	SMDC	Nonfood use	--*	L	--	310	Preplant soil fumigation.	Cultivate 5-7 days after application. Do not plant with- in 7 days after treatment on light soils or 14 days on heavy soils. Do not plant within 30 days if soil temperature is below 60° F.

## OILSEED AND INDUSTRIAL CROP DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
PEANUT								
Leaf spots ( <i>Cercospora</i> <i>personata</i> and <i>C. arachidicola</i> )	benomyl	0.2	14	WP	0.188-0.250 lb. in sufficient water/acre by ground equipment; 5-10 gal./ acre by aircraft	--	Begin when disease first appears; repeat at 10-14 day intervals, or at 7- day intervals in humid weather	Do not graze or feed treated vines, hay or hulls to live- stock.
	chlorothalonil	0.3	14	WP	--	0.75-1.125 in sufficient water/acre	Begin when disease first appears; repeat at 10-14 day intervals, more frequently under severe conditions.	Do not graze treated areas. Do not use hay or threshings from treated fields as feed.
	copper-sulfur	Exempt	--	D 4% metallic copper from tribasic copper or cuprous oxide with 325-mesh sulfur	--	15-25	Begin when spots first appear on lower leaves. If a heavy rain occurs within 24 hr. after first application, repeat in 3-7 days, otherwise repeat at 10-14 day intervals.	Do not feed treated forage to dairy animals or animals being finished for slaughter.
	NIA 9102	Extended	NTL	WP or D	0.8-1.6 /25-30 gal. /acre by ground equipment; 1.14-1.6 /4 gal./ acre by aircraft	1-1.5 D by ground equipment or air- craft	Begin when spots first appear on lower leaves. If a heavy rain occurs within 24 hours after first application, repeat in 3-7 days, otherwise repeat at 10-14 day in- tervals.	Do not feed treated forage to dairy animals or animals being finished for slaughter.
	zinc-ion maneb complex	65 in or on vine hay 0.5 in or on nuts	14	WP	--	0.8-1.6 in sufficient water for thorough coverage	Begin when disease first appears; repeat at 10-14 day intervals, or at 7- day intervals in humid weather.	Do not feed treated vines to livestock.

## OILSEED AND INDUSTRIAL CROP DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
PEANUT	PCNB	Extended	--*	D	--	1.61/1000 linear ft. of row or 1.51/1000 linear ft. of row or 0.48/1000 linear ft. of row	Preplanting soil appli- cation in 8-12 inch bands.  At pegging time in 12- inch band as soil surface treatment.  At cultivation times in 12-inch bands in each of 3 applications.	Do not feed treated peanut hay to live- stock.  Do not feed treated peanut hay to live- stock.  Do not feed treated peanut hay to live- stock.
Stem rot or Southern blight ( <u>Sclerotium rolfsii</u> )								
Rust ( <u>Puccinia</u> <u>arachidis</u> )								
	chlorothalonil	0.3	14	WP	--	1.125 in sufficient water/acre	Begin when disease first appears; repeat at 10-14 day intervals, more frequently under severe conditions.	Do not graze treated areas. Do not use hay or threshings from treated fields as feed.

Damping-off and  
seed decay

(See seed treatment lists - captan, maneb, and thiram)

SAFFLOWER	thiram	Nonfood use	--*	WP or D	--	2 oz./100 lb.	Seed treatment (slurry).	Do not use treated seed for food, feed, or oil.
Rust ( <u>Puccinia carthami</u> ), Damping-off and seed decay								

\* Does not apply.

Issued December 1972

Use Pesticides Safely--Follow the Label

## OILSEED AND INDUSTRIAL CROP DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
<b>SESAME</b>								
Damping-off and seed decay	captan	Nonfood use	---*	WP	--	1 oz./100 lb.	Seed treatment (slurry only).	Do not use treated seed for food, feed, or oil.
	thiram	Nonfood use	---*	WP or D	--	1.5 oz./ 100 lb.	Seed treatment (dry or slurry).	Do not use treated seed for food, feed, or oil.
<b>SOYBEANS</b>								
General seedling diseases and Damping-off	captan	Nonfood use	---*	WP	--	1.3 oz./ 100 lb.	Seed treatment (slurry).	Do not use treated seed for food, feed, or oil.
				D	--	1.7-2 oz./ 100 lb.	Seed treatment (dry).	
	chloranil	Nonfood use	---*	WP	--	4.1 oz./ 100 lb.	Seed treatment (dry or slurry).	Do not use treated seed for food, feed, or oil.
				D	--	--	May also be used at 2.5 oz./100 lb. in planter box.	
	thiram	Nonfood use	---*	WP or D	--	1 oz./100 lb. D	Seed treatment (dry).	Do not use treated seed for food, feed, or oil.
						1-1.8 oz./ 100 lb. SL	Seed treatment (slurry).	

\* Does not apply.

Issued December 1972



## OILSEED AND INDUSTRIAL CROP DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
SUNFLOWER	captan	Nonfood use	--*	D	--	0.5 oz./ 100 lb.	Seed treatment (dry).	Do not use treated seed for food, feed, or oil.
Damping-off and seed decay								

\* Does not apply.  
Issued December 1972

**SHADE TREE DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
ELM								
Dutch elm ( <i>Ceratocystis ulmi</i> ) (con.)	SMDC			Dilute 1 volume SMDC with 3 volumes water	--	--	Immediately after tree is diagnosed as having the disease, isolate tree from healthy trees by drilling series of holes about 0.75 inch in diameter, 15 inches deep, and 6 inches apart, in line between diseased and healthy trees, sufficiently long to kill all elm roots of the 2 adjacent trees that are likely to be root graft- ed. Fill each hole with diluted solution to within 2 inches of soil surface.	To prevent root graft transmission. Professional applicators only.
Anthracnose or Black leaf spot ( <i>Gnomonia ulmea</i> )	bordeaux mixture			WP	4-4-100	--	Apply as leaves unfold in spring; repeat in 2-3 weeks.	
HAWTHORN								
Rust ( <i>Gymnosporangium</i> spp.)	sulfur			WP	2	--	Begin when orange spore masses appear on cedar trees. Make 4-5 applica- tions at 7-10 day intervals.	
	zineb			WP	1.125-1.5	--	Apply at bud break; repeat 7-14 days later.	

# SHADE TREE DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
ASH								
Anthracnose ( <u>Gloeosporium</u> <u>aridum</u> )	captafol			FS	1.5-2.0 from flow- able formu- lation	—	Apply when disease is first noted. Use higher rates when severe disease conditions exist.  Spray trees thoroughly.	See manufacturer's label for use in California.
ELM								
Dutch elm ( <u>Ceratocystis ulmi</u> )	benomyl			WP	4	—	Foliar spray in spring when trees reach full leaf. Apply 2-3 gal. diluted spray mixture per mature tree, using a concentrate sprayer. Surfactant may be added to improve wetting of foliage; or Trunk injection at any time during the growing season, preferably when trees reach full leaf in the spring. Repeat treatments may be made. Use injector tubes equipped with approxi- mately 2.0 fl. oz. capacity cups. Tubes should be inserted into outer growth rings, just far enough to prevent leaking of treatment fluid at point of entry. Space injector tubes at 2-inch intervals around the trunk, fill cups and leave in place for 24-48 hours, refilling cups as needed. Remove injector tubes when treat- ment has been completed.	To be used only by trained arborists in conjunction with sanitation and insect control programs.

Continued

SHADE TREE DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
HICKORY								
Anthrachnose ( <u>Gnomonia caryae</u> ) and Leaf spots, various	zineb			WP	1.125-1.5	--	Apply at bud break; repeat 7-12 days later.	
HORSE CHESTNUT								
Leaf blotch ( <u>Guignardia aesculi</u> ) and Anthracnose ( <u>Glomerella cingulata</u> )	zineb			WP	1.125-1.5	--	Apply at bud break; repeat 7-12 day later.	
JUNIPER								
Rust ( <u>Gymnosporangium</u> spp.)	ferbam			WP or D	0.76-1.14	Dust to cover	Begin before disease appears; repeat at 7- 10 day intervals until bloom, and after bloom as necessary.	
	zineb			WP	1.125-1.5	--	Apply monthly as necessary.	
MAPLE								
Tar spot ( <u>Rhytisma acerinum</u> )	bordeaux mixture			WP	4-4-100	--	Apply as leaves unfold in spring; repeat in 2-3 weeks.	

Continued

**SHADE TREE DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
MAPLE								
Tar spot ( <u>Rhytisma acerinum</u> ) (con.)	copper oxychloride sulfate			WP	2.2 plus 2.0 of hydrated lime	--	Begin when disease is first reported in area; repeat at 10-12 day intervals as required.	
OAK								
Anthracnose ( <u>Gnomonia quercina</u> )	bordeaux mixture			WP	4-4-100	--	Apply as leaves unfold in spring; repeat in 2-3 weeks.	See manufacturer's label for use in California.
	captafol			FS	1.5-2.0 from flow- able formulation	--	Apply when disease is first noted. Use higher rates when severe disease conditions exist.  Spray trees thoroughly.	
	copper oxychloride sulfate			WP	2.2 plus 2.0 of hydrated lime	--	Begin when disease is first reported in area; repeat at 10-12 day intervals as required.	
	zineb			WP	1.125-1.5	--	Apply at bud break; repeat 7-12 days later.	

**SHADE TREE DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
<b>PINE</b>								
<u>Fusiform rust</u> ( <u>Cronartium</u> <u>fusiforme</u> )	ferbam			WP	0.76-1.5	--	Apply at 3-7 day inter- vals from plant emer- gence as needed.	Used on pine seedlings in nursery beds.
	ziram			WP	1.52	--	Begin at time of emer- gence; repeat at 3-5 day intervals to mid-June.	Used on pine seedlings in nursery beds.
<u>White pine blister</u> <u>rust</u> ( <u>Cronartium</u> <u>ribicola</u> )	cycloheximide			L	1 tablespoon (150 ppm 4% conc.) + 0.25 fluid oz. Triton B1956/gal. No. 1 fuel oil	--	See manufacturer's label.	
<b>QUINCE, FLOWERING</b>								
<u>Leaf spot and</u> <u>Rust</u> ( <u>Gymnosporangium</u> <u>clavipes</u> )	zineb			WP	1.125-1.5	--	Keep new growth covered from prepink through growing season.	
<b>SYCAMORE</b>								
<u>Anthraco nose</u> ( <u>Gnomonia veneta</u> )	bordeaux mixture			WP	4-4-100	--	Apply as leaves unfold in spring; repeat in 2-3 weeks.	
	captafol			FS	1.5-2.0 from flow- able formu- lation	--	Apply when disease is first noted. Use higher rates when severe disease conditions exist. Spray trees thoroughly.	See manufacturer's label for use in California.

Continued

SHADE TREE DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
SYCAMORE								
Anthracnose ( <i>Gnomonia veneta</i> ) (con.)	dodine			WP	1	--	Apply when buds start to swell; repeat, using 0.65 lb./100 gal. when buds break, and again 10-14 days later.	
	zineb			WP	1.125-1.5	--	Apply at bud break; repeat 7-12 days later.	

TREE-NUT DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
ALMOND								
Brown rot ( <u>Monilinia laxa</u> )	bordeaux mixture	Exempt	NTL	WP	10 copper sulfate + 10 lime	--	Apply in red-bud to popcorn stage.	
	captan	2.0 on almonds, 100 on almond hulls	12	WP or D	1	2.5-4	Apply in popcorn, bloom, and petal fall periods, and 5 weeks later.	When applied after petal fall, do not feed almond hulls to dairy animals or animals being finished for slaughter.
	maneb	0.1	Do not apply later than 5 weeks after petal fall	WP	1.2-1.6	--	Apply in popcorn, full bloom, and petal fall, or every 7-10 days if bloom is staggered.	When applied after petal fall, do not feed almond hulls to dairy animals or animals being finished for slaughter.
	sodium penta-chlorophenate	Nonfood use	NTL	WP	3-3.4	--	Dormant application only; ground equipment only.	
Scab ( <u>Cladosporium carpophilum</u> )	captan	2.0 on almonds, 100 on almond hulls	12	WP or D	1	2.5-4	Apply in popcorn, bloom, petal fall periods, and 5 weeks later.	When applied after petal fall, do not feed almond hulls to dairy animals or animals being finished for slaughter.
	ziram	0.1	Do not apply later than 5 weeks after petal fall	WP	1.14-2.33	--	Apply in petal fall, and 5 weeks later.	



**TREE-NUT DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
<b>ALMOND</b>								
<u>Shot hole</u> ( <u>Coryneum</u> <u>beijerinckii</u> )	captan	2.0 on almonds, 100 on almond hulls	12	WP or D	1	2.5-4	Apply in popcorn, bloom, petal fall periods, and 5 weeks later.	When applied after petal fall, do not feed almond hulls to dairy animals or animals being finished for slaughter.
	ziram	0.1	Do not apply later than 5 weeks after petal fall	WP	1.14-1.52	--	Apply in popcorn, full bloom, and petal fall, and 5 weeks later.	
<u>Leaf blight</u> ( <u>Hendersonia rubi</u> )	sodium penta- chlorophenate	Nonfood use	NTL	WP	3-3.4	--	Dormant application only; ground equipment only.	
<b>PECAN</b>								
<u>Scab</u> ( <u>Cladosporium</u> <u>effusum</u> )	dodine	0.3	Do not apply after shucks have started to open	WP	0.33-0.65 by ground equipment	--	Begin when first leaves are showing; repeat at 10-14 day intervals through first cover, and at 2-3 week intervals as needed thereafter.	Do not graze meat or dairy animals in treated groves. Moore and Van Deman varieties may be injured in the Southeastern States.
					1.3-2.6 per 20 gal. or more/ acre by aircraft	--		

Continued

TREE-NUT DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
PECAN								
Scab ( <u>Cladosporium</u> ) <u>effusum</u> (con.)	NIA 9102	0.5	Do not apply after shuck split	WP or D	1.6	6.4/20 or more gal./acre	Apply 1.6 lb./100 gal. by hydraulic equipment or 6.4 lb./20 or more gal./acre by aircraft or mist blower equipment. Begin when buds are opening and leaves are showing. Repeat in 10- 14 days or when leaves are half grown; when tips of small nuts have turned brown, and as required to control until shuck split.	Do not graze treated areas.
	TPTH	0.05	Do not apply after shucks start to open	WP	0.1-0.29	--	Apply as full coverage sprays. Begin at pre- pollination stages when young leaves are unfold- ing. Repeat when small nuts are forming, and at 2-4 weeks intervals as needed until shucks begin to split.	Do not graze live- stock on treated areas.
Brown leaf spot ( <u>Cercospora fusca</u> ), Downy spot ( <u>Mycosphaerella</u> <u>caryigena</u> ), Vein spot ( <u>Gnomonia nerviseda</u> ), Leaf blotch ( <u>Mycosphaerella</u> <u>dendroides</u> ), Liver spot ( <u>Gnomonia caryae</u> var. <u>pecanae</u> ), and Pink mold ( <u>Cephalothrium</u> <u>roseum</u> )	dodine	0.3	Do not apply after shucks have start- ed to open	WP	0.33-0.65 by ground equipment  1.3-2.6 by air- craft	--  --	Begin when first leaves are showing; repeat at 10-14 day intervals through first cover, and at 2-3 week intervals as needed thereafter.	Do not graze meat or dairy animals in treated groves. Moore and Van Deman varieties may be injured in the Southeastern States.

**TREE-NUT DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
PECAN								
<b>Powdery mildew</b> <b>(<u>Microsphaera alni</u>)</b>	wettable sulfur	Safe	NTL	WP	6 of 95%	--	Apply in third, fourth, and fifth cover sprays.	
WALNUT								
<b>Anthracnose or</b> <b>Leaf blotch</b> <b>(<u>Gnomonia leptostyla</u>)</b>	dodine	0.3	Do not apply after hulls begin to split	WP	0.65	--	Apply when leaves unfold; repeat at 10-14 day intervals.	Do not graze meat or dairy animals in treated groves.
<b>Bacteriosis</b> <b>(<u>Xanthomonas</u></b> <b><u>juglandis</u>)</b>	bordeaux mixture	Exempt	NTL	WP	Dosage varies according to State	--	Apply in prebloom and bloom stages.	

## TURFGRASS DISEASES

DISEASE AND CROP	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	OUNCES OF ACTIVE INGREDIENT TO APPLY PER 1,000 SQ. FT. UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
Brown patch ( <i>Rhizoctonia solani</i> ) Bentgrasses Bluegrasses Bermudagrass Ryegrass St. Augustinegrass Zoysiagrasses Centipedegrass Fine leaf fescues Tall fescue	anilazine			WP	2-4	During warm, humid weather, every 5-14 days.	For all chemicals on this page:
	benomyl			WP	1	Apply as a drench when disease first appears; repeat at 10-14 day intervals as long as needed; at 5-7 day intervals if disease is unusually severe.	Do not graze treated areas. Do not feed clippings to live-stock.
	cadmium chloride			L	1 of 20.1% formulation	June-September, every 10-14 days.	
	chlorothalonil			WP	1.5-3	Begin before disease appears; repeat at 7-14 day intervals throughout the season.	
	folpet-cadmium carbonate-thiram			WP	Follow manufacturer's directions		
	maneb			WP	2.4-6.4 in sufficient water	Begin when disease first appears; repeat at 7-14 day intervals.	
	PCNB			WP	Follow manufacturer's directions		
	thiabendazole			WP	0.5-1.2	Begin when disease first appears; repeat at weekly intervals.	
	thiram			WP	2.5	Begin when disease is first noticed; repeat at 7-10 day intervals as necessary.	
	zinc ion-maneb complex, turf formulation			WP	4 of formulation	Begin when grass greens up in spring; repeat at 7-14 day intervals throughout the season.	

## TURFGRASS DISEASES

DISEASE AND CROP	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	OUNCES OF ACTIVE INGREDIENT TO APPLY PER 1,000 SQ. FT. UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
Copper spot ( <u>Gloeocercospora</u> <u>sorghi</u> ) Bentgrasses	anilazine			WP	2-4	During warm, humid weather, every 5-14 days.	For all chemicals on this page:
	cadmium chloride			L	1 of 20.1% for- mulation	June-September, every 10-14 days.	Do not graze treated areas. Do not feed clippings to live- stock.
	cadmium sebacate 5.0% potassium chromate 5.0% malachite green 1.0% auramine 0.5% thiram 16%			WP	2-8 of formulation		
	cadmium succinate			WP	0.3	Begin when disease is first noticed; repeat at 1-week intervals until disease is controlled.	
	captan			WP	1.6	Begin when growth starts in spring; repeat at 7-14 day intervals throughout the season.	
	chlorothalonil			WP	3.0-4.5	Begin before disease ap- pears; repeat at 7-10 day intervals. Use a 7-day schedule for curative purposes or under conditions favoring disease develop- ment.	
	thiram			WP	2-3.5	Begin when disease is first noticed; repeat at 7-10 day intervals as necessary.	

Continued

TURFGRASS DISEASES

DISEASE AND CROP	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	OUNCES OF ACTIVE INGREDIENT TO APPLY PER 1,000 SQ. FT. UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
Copper spot ( <u>Gloeocercospora</u> <u>sorghii</u> ) Bentgrasses (con.)	zinc ion-maneb complex, turf formulation			WP	4 of formulation	Begin when grass greens up in spring; repeat at 7-14 day intervals throughout the season.	For all chemicals on this page:  Do not graze treated areas. Do not feed clippings to live- stock.
Dollar spot ( <u>Sclerotinia</u> <u>homoeocarpa</u> ) Bentgrasses Bluegrasses Bermudagrass Ryegrass Fescues Zoysiagrasses, St. Augustinegrass Centipede grass	anilazine  benomyl  cadmium chloride  cadmium succinate  chlorothalonil  cycloheximide- thiram  folpet-cadmium carbonate-thiram  maneb			WP  WP  L  WP  WP  WP  WP  WP	2-4  0.5  1 of 20.1% for- mulation  0.3  1.5-3  Follow manufac- turer's directions  Follow manufac- turer's directions  4.8-6.4 in suffi- cient water	During warm, humid weather, every 5-14 days.  Apply as a drench when disease first appears; repeat at 10-14 day intervals.  June-September, every 10-14 days.  Begin when disease is first noticed; repeat at 1-week intervals until disease is controlled.  Begin before disease ap- pears; repeat at 7-14 day intervals. Use a 7-day schedule for curative purposes or under severe disease conditions.  Disease can occur from May to October. Spray at 7-14 day intervals until disease is controlled.  Begin when disease first appears; repeat at 7-14 day intervals.	

Continued

TURFGRASS DISEASES

DISEASE AND CROP	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	OUNCES OF ACTIVE INGREDIENT TO APPLY PER 1,000 SQ. FT. UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
Dollar spot ( <i>Sclerotinia</i> <i>homoeocarpa</i> ) Bentgrasses Bluegrasses Bermudagrass Ryegrass Fescues Zoysiagrasses St. Augustinegrass Centipede grass (con.)	thiabendazole			WP	0.5-1.2	Apply from spring to October. Treat at 7-14 day intervals until disease is controlled.	For all chemicals on this page:  Do not graze treated areas. Do not feed clippings to live-stock.
	thiram			WP	2-5	Begin when disease is first noticed; repeat at 7-14 day intervals as necessary.	
	zinc ion-maneb complex, turf formulation			WP	4-6	Begin when grass greens up in spring; repeat at 7-14 day intervals throughout the season.	
Fading out ( <i>Curvularia</i> sp.) Most turfgrasses	cadmium chloride			L	1 of 20.1% formulation	June-September, every 10-14 days.	
	chlorothalonil			WP	1.5-3	Begin before disease appears; repeat at 7-14 day intervals throughout the season.	
	cycloheximide-thiram			WP	Follow manufacturer's directions	Disease can occur from April to August. Spray at 7-14 day intervals until disease is controlled.	
	zineb			WP	1.5	Begin in early spring or before disease appears; repeat at 7-14 day intervals.	
Fairy rings and Mushrooms ( <i>Marasmius</i> spp., <i>Psalliota campestris</i> , and <i>Lepiota</i> spp.) Most turfgrasses	MBR-CP			L	Follow manufacturer's directions		

## TURFGRASS DISEASES

DISEASE AND CROP	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	OUNCES OF ACTIVE INGREDIENT TO APPLY PER 1,000 SQ. FT. UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
Fusarium blight ( <u>Fusarium roseum</u> ) Bentgrasses Bluegrasses, especially Merion Kentucky Fescues Ryegrass	benomyl			WP	2.5-4	Apply as a drench when disease first appears; repeat 10-14 days later.	For all chemicals on this page:  Do not graze treated areas. Do not feed clippings to live- stock.
	zinc ion-maneb complex, turf formulation			WP	4-6	April-September, every 7-10 days.	
Gray leaf spot ( <u>Piricularia grisea</u> ) St. Augustinegrass	captan			WP	1.6	Begin when growth starts in spring; repeat at 7- 14 day intervals through- out the season.	
	chlorothalonil			WP	1.5-3	Begin before disease ap- pears; repeat at 7-14 day intervals through- out the season.	
	folpet-cadmium carbonate-thiram			WP	Follow manufac- turer's directions	Apply as a drench from spring-fall, every 5-14 days during extended warm periods.	
	thiram			WP or D	0.9 lb. as a dust or 1.14 lb./25-50 gal./5000 sq. ft.		
	zineb			WP	3	Begin before disease appears; repeat at 8-10 day intervals.	



## TURFGRASS DISEASES

DISEASE AND CROP	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	OUNCES OF ACTIVE INGREDIENT TO APPLY PER 1,000 SQ. FT. UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
Helminthosporium diseases: Melting-out ( <i>H. vagans</i> ) Kentucky bluegrass	anilazine			WP	2-4	During warm, humid weather, every 5-14 days.	For all chemicals on this page:
	captan			WP	1.6	Begin when growth starts in spring; repeat at 7-14 day intervals throughout season.	Do not graze treated areas. Do not feed clippings to livestock.
Zonate eyespot ( <i>H. giganteum</i> ) Tall fescue Bentgrasses Bluegrasses Bermudagrass Fescues Ryegrass	chlorothalonil			WP	1.5-3	Begin in early spring and continue at 7-14 day intervals until summer.	
	maneb			WP	2.4-6.4 in sufficient water	Begin when disease first appears; repeat at 7-14 day intervals.	
Helminthosporium leaf spot ( <i>H. sorokinianum</i> ) Bentgrasses Bluegrasses Fescues Ryegrass	mixture of 5 chemicals (listed for copper spot control on bentgrasses)			WP	2-8 of formulation		
	thiram			WP	2.5-3.5	Begin in early spring; repeat at 7-10 day intervals while temperatures are between 45-80° F, and again in fall.	
Red leaf spot ( <i>H. erythrosphilum</i> ) Bentgrasses							
Helminthosporium blight ( <i>H. dictyoides</i> ) Fescues Ryegrass	zinc ion-maneb complex, turf formulation			WP	4 of formulation	Begin when grass greens up in spring; repeat at 7-14 day intervals throughout the season.	
	zineb			WP	1.5	Begin in early spring before disease appears; repeat at 7-14 day intervals.	
Brown blight ( <i>H. siccans</i> ) Ryegrass Fescues							

Continued

## TURFGRASS DISEASES

DISEASE AND CROP	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	OUNCES OF ACTIVE INGREDIENT TO APPLY PER 1,000 SQ. FT. UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
<p><u>Helminthosporium</u> diseases: Leaf blotch (<u>H. cynodontis</u>) Bermudagrass</p> <p><u>Helminthosporium</u> spp. Zoysiagrasses St. Augustinegrass Centipedegrass (con.)</p>	<p>Refer to fungicides on previous page.</p>						<p>For all chemicals on this page:</p> <p>Do not graze treated areas. Do not feed clippings to live- stock.</p>
<p>Pythium blight (<u>Pythium</u> <u>aphanidermatum</u> and <u>P. ultimum</u>) Bentgrasses Bluegrasses Ryegrass Bermudagrass Fescues Zoysiagrasses</p>	<p>Bay 22555</p> <p>cadmium chloride</p> <p>chloroneb</p> <p>ETMT</p> <p>zinc ion-maneb complex, turf formulation</p> <p>zineb</p>			<p>WP</p> <p>L</p> <p>WP</p> <p>WP</p> <p>WP</p> <p>WP</p>	<p>2-4 of formulation</p> <p>1 of 20.1% for- mulation</p> <p>2.6/3-5 gal. water</p> <p>1.4-2.8</p> <p>8 of formulation</p> <p>1.0-1.5</p>	<p>Apply at 1-2 week inter- vals throughout the season.</p> <p>June-September, every 10-14 days.</p> <p>Apply during periods of high temperature and humidity; repeat in 5-7 days if conditions persist.</p> <p>Begin when disease ap- pears; repeat at 5-10 day intervals as long as necessary.</p> <p>Begin at first sign of disease; repeat at 5-day intervals, more frequent- ly under severe conditions.</p> <p>Begin before disease ap- pears; repeat at 3-10 day intervals.</p>	<p>Do not apply in combination with other pesticides or with nutrients.</p>

## TURFGRASS DISEASES

DISEASE AND CROP	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	OUNCES OF ACTIVE INGREDIENT TO APPLY PER 1,000 SQ. FT. UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
Powdery mildew ( <u>Erysiphe graminis</u> ) Bermudagrass Bluegrasses Fescues	cycloheximide- thiram			WP	Follow manufactur- er's directions	When the disease is first evident in spring or early fall, apply at 10- day intervals.	Do not graze treated areas. Do not feed clippings to live- stock.  Spray or dust leaves of affected plants only.
	sulfur			D	4-8		
Red thread ( <u>Corticium fuciforme</u> ) Bentgrasses Bluegrasses Ryegrass Fescues	cadmium chloride			L	1 of 20.1% formulation	May-June and August- September, every 10-14 days.  Begin when disease is first noticed; repeat at 1-week intervals until disease is controlled.	For the remainder of all chemicals on this page:  Do not graze treated areas. Do not feed clippings to live- stock.
	cadmium succinate			WP	0.3		
	cycloheximide- thiram			WP	4 of formulation		
	folpet-cadmium carbonate-thiram			WP	Follow manufac- turer's directions		
	mixture of 5 chemicals (listed for copper spot control of bent- grasses)			WP	2-8 of formulation		
	zinc ion-maneb complex, turf formulation			WP	4-6		

## TURFGRASS DISEASES

DISEASE AND CROP	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	OUNCES OF ACTIVE INGREDIENT TO APPLY PER 1,000 SQ. FT. UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
Rust ( <i>Puccinia</i> spp.) Bluegrasses, especially Merion Kentucky Zoysiagrasses	anilazine			WP	2-4	During warm, humid weather, every 5-14 days.	For all chemicals on this page:
	cycloheximide- thiram			WP	Follow manufac- turer's directions	June-September, every 7-14 days.	Do not graze treated areas. Do not feed clippings to live- stock.
	maneb			WP	2.2-6.4 in suffi- cient water	Begin when rust pustules first appear; repeat at 7-14 day intervals.	
	zinc ion-maneb complex, turf formulation			WP	4 of formulation		
	zineb			WP	1.0-1.5	Begin when disease first appears; repeat at 10- 14 day intervals.	
Slime molds (non-parasitic) ( <i>Myxomycete</i> spp.) Most turfgrasses	zineb			WP	1.5	During periods of wet or humid weather when slime molds occur.	May be dispersed mechanically by brushing, mowing, or spraying with strong stream of water.
Snow molds ( <i>Typhula</i> spp.) and Fusarium patch ( <i>Fusarium nivale</i> ) Bentgrasses Bluegrasses Bermudagrass Ryegrass Fescues	benomyl			WP	1	Apply as a drench when disease first appears; repeat at 10-14 day intervals as long as needed.	For Fusarium only.
	cadmium succinate			WP	1.2-2.4	Apply in late fall before ground freezes and before first residual snow cover is expected; repeat during midwinter thaw.	Not effective against Fusarium.

Continued

## TURFGRASS DISEASES

DISEASE AND CROP	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	OUNCES OF ACTIVE INGREDIENT TO APPLY PER 1,000 SQ. FT. UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
Snow molds ( <i>Typhula</i> spp.) and Fusarium patch ( <i>Fusarium nivale</i> ) Bentgrasses Bluegrasses Bermudagrass Ryegrass Fescues (con.)	chloroneb			WP	3.90-5.85 in suf- ficient water for thorough coverage	Apply as late in fall as possible before snowfall; repeat in midwinter if turf is free of snow, and in late winter as snow melts.	For all chemicals on this page:  Do not graze treated areas. Do not feed clippings to live- stock.  For Typhula only.
	chlorothalonil			WP	5-6	Apply in the fall; repeat at 7-14 day intervals as necessary.	For Fusarium only. For use in Oregon and Washington only.
	thiabendazole			WP	0.5-1.2	Apply as late in fall as possible before snowfall; repeat in midwinter if turf is free of snow, and in late winter as snow melts.	For Fusarium only.
Spring dead spot (undetermined cause) Bermudagrass	nabam			WP	4-8 of formulation	October-December, every 30 days.	
Stripe smut ( <i>Ustilago</i> <i>striiformis</i> ) Bentgrasses Bluegrasses, especially Merion Kentucky Meadow fescue Redtop Ryegrass	benomyl			WP	2-3/2-5 gal.	Apply in October or early spring before grass be- gins growth. After treatment, water turf sufficiently to carry product to base of plants.	

VEGETABLE DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
ASPARAGUS								
Rust ( <u>Puccinia asparagi</u> )	maneb	Nonfood use	---*	WP	--	2.4	Postharvest application only on established fields; repeat at 10-day intervals as long as necessary.	
	NIA 9102	Nonfood use	---*	WP	1.6-2.4/ 50 gal./ acre by ground; 2.4/5-10 gal./acre by aircraft	--	Begin applications in mid-August or when disease first appears; repeat at 7-10 day intervals for a total of 4 applications.	
	zinc ion-maneb complex	Nonfood use	---*	WP	--	1.6 in sufficient water to cover thoroughly	Begin when rust first appears; repeat at 10-day intervals. Use only on ferns after spears have been harvested.	
	zineb	Extended	---*	WP	1.5-2.25	--	Apply immediately after harvest; repeat at 10-day intervals as long as necessary. In young fields not to be harvested, start when disease first appears in the area.	
BEAN, LIMA								
Downy mildew ( <u>Phytophthora phaseoli</u> ) and Stem anthracnose ( <u>Colletotrichum truncatum</u> )	maneb	7-dry 10-succulent	NTL 4	WP or D	1.2-1.6	2	Begin at first sign of disease; repeat at 4-7 day intervals.	

## VEGETABLE DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
BEAN, SNAP								
<u>Anthracnose</u> ( <u>Colletotrichum</u> <u>lindemuthianum</u> )	captan	25	NTL	WP or D	0.5	2-3	Begin before disease appears, or at first sign of disease; repeat at 4-10 day intervals or as necessary to maintain control.	Do not feed treated plant parts to live-stock.
	dichlone	3	7	D	--	0.50-1.12	Begin just before bloom; repeat 3-4 times at weekly intervals.	
	ferbam	7	4	WP or D	1.5	1.7-2.9	Begin when disease appears; repeat at 7-10 day intervals.	
	maneb	7-dry 10-succulent	NTL 4	WP or D	1.2-1.6	1.05-3.2	Begin when plants are small; repeat at 5-7 day intervals.	
	zineb	7	7	WP or D	0.65-1.5	0.6-3.0	Begin when disease threatens or after first blooms appears; repeat at 4-10 day intervals.	
	ziram	7	4	WP or D	2.38	1.9-3.0	Begin before disease is expected to appear, or at first sign of infection; repeat at 4-7 day intervals.	
<u>Rust</u> ( <u>Uromyces phaseoli</u> )	captan	25	NTL	WP or D	0.5	2-3	Begin before disease appears, or at first sign of disease; repeat at 4-10 day intervals or as necessary to maintain control.	

Continued

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Use Pesticides Safely—Follow the Label

**VEGETABLE DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
BEAN, SNAP								
<u>Sclerotinia wilt</u> ( <u>Sclerotinia</u> <u>sclerotiorum</u> ) (con.)	DCNA	20	2	WP or D	3-pole	3-pole	Begin when disease is anticipated; repeat at 7-day intervals as necessary.	Do not feed treated forage to livestock.
	PCNB	Extended	Do not apply after first bloom	WP or D	--	--	See manufacturer's label.	Do not feed treated vines to livestock.
	ziram	7	4	WP or D	0.75-1.125	3	Begin before disease is expected to appear, or at first sign of infection; repeat at 7-10 day intervals.	For use in Pacific Northwest only.
<u>Powdery mildew</u> ( <u>Erysiphe polygoni</u> )	sulfur	Safe	NTL	WP or D	4-7.8	3.8-36	Begin when first true leaves form or at first sign of disease; repeat at 7-10 day intervals.	Sulfur may injure certain varieties of beans.
<u>Bacterial blight</u> ( <u>Xanthomonas phaseoli</u> ) and Halo blight ( <u>Pseudomonas phaseolicola</u> )	fixed copper	Exempt	NTL	WP or D	--	1.08 (copper hydroxide)	Apply as a protective spray when plants are 6 inches high, and continue at 7-10 day intervals through harvest.	

Seed decay and  
Damping-off

(See seed treatment lists - captan, chloranil, chloroneb, dichlone, sodium p-(dimethylamino)benzenediazosulfonate, thiram, and zineb)



**VEGETABLE DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
<b>BEAN, SNAP</b>								
<u>Rust</u> ( <u>Uromyces phaseoli</u> ) (con.)	chlorothalonil	5	7	WP	--	2.25	Begin in early bloom stage or when disease first threatens; repeat at weekly intervals or as necessary to maintain control.	
	maneb	7-dry 10-succulent	NTL 4	WP or D	1.2-1.6	1.05-3.2	Begin when plants are small; repeat at 5-7 day intervals.	
	zineb	7	7	WP or D	0.65-1.5	0.6-3.0	Begin when disease threatens, or after first bloom appears; repeat at 4-10 day intervals.	
	ziram	7	4	WP or D	2.38	1.9-3.0	Begin before disease is expected to appear, or at first sign of infection; repeat at 4-7 day intervals.	
<u>Sclerotinia wilt</u> ( <u>Sclerotinia sclerotiorum</u> )	benomyl	2	14	WP	--	0.75-1.0	Make first application at 25-50% bloom; repeat at peak of bloom.	Do not graze or feed treated vines or hay to live-stock. Ground equipment only.
	calcium cyanamide	Nonfood use	Do not apply later than 30 days before planting	G	--	222-444	Apply as a broadcast treatment to the soil and mix into top 3-4 inches of soil.	
	DCNA	20	2	WP or D	3-pole	2.25-bush	Begin when disease is anticipated; repeat at 7-day intervals as necessary.	Do not feed treated forage to live-stock.

Continued

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**VEGETABLE DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
<b>BEET, TABLE</b>								
<b>Leaf spot (<i>Cercospora beticola</i>)</b>	captan	2-roots 100-greens	NTL	WP	1	—	Begin before disease appears; repeat at 7-10 day intervals.	
	nabam + zinc sulfate	7-roots 25-tops	7 if tops are to be consumed	WP	0.86-1.05 nabam + 0.75 zinc sulfate containing 36% metal- lic zinc	—	Begin when disease appears; repeat in 7 days.	
	zineb	7-roots 25-tops	7 if tops are to be consumed	WP	0.65-1.5	0.6-3.0	Begin when disease appears; repeat in 7 days.	

Seed decay and  
Damping-off  
various causes

(See seed treatment lists - captan, dichlone, sodium p-(dimethylamino)benzenediazosulfonate,  
thiram, and zineb)

<b>BROCCOLI</b>								
<b>Alternaria leaf spot (<i>Alternaria brassicae</i>)</b>	chloranil	Nonfood use	---	WP or D	2	0.5-1.7	Apply in plant bed only. Begin 7-10 days after seeding; repeat at 3-5 day intervals until all usable plants are drawn.	
		Nonfood use	NTL	WP or D	1	1.5-2	Begin when plants are set in field, or if direct seeded, begin 7- 10 days after planting; repeat at 3-7 day inter- vals until seed harvest.	Field planting. (Crops grown for seed only.)

Continued

\* Does not apply.

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**VEGETABLE DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
<b>BROCCOLI</b>								
<u>Alternaria leaf spot</u> ( <u>Alternaria</u> <u>brassicae</u> ) (con.)	chlorothalonil	5	NTL	WP	--	1.125	Begin after transplants are set in field, or shortly after emergence of field-seeded crop, or when conditions favor disease development.	Southeastern States only.
	maneb	10	3	WP or D	1.2-1.6	Up to 4	Begin when disease threatens; repeat at 7-day intervals.	Remove residues by washing or trimming if application is made within 3 days of harvest.
	zineb	7	7	WP or D	0.65-1.5	0.6-3.0	Begin when disease threatens; repeat at 7-10 day intervals.	
<u>Downy mildew</u> ( <u>Peronospora</u> <u>parasitica</u> )	chloranil	Nonfood use	--*	WP or D	2	0.5-1.7	Apply in plant bed only. Begin 7-10 days after seeding; repeat at 3-5 day intervals until all usable plants are drawn.	
		Nonfood use	NTL	WP or D	1	1.5-2	Begin when plants are set in field, or if direct seeded, begin 7-10 days after planting; repeat at 3-7 day intervals until seed harvest.	Field planting. (Crops grown for seed only.)
	chlorothalonil	5	NTL	WP	--	1.125	Begin after transplants are set in field, or shortly after emergence of field-seeded crop, or when conditions favor disease development.	

Continued

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**VEGETABLE DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
<b>BROCCOLI</b>								
<u>Downy mildew</u> ( <u>Peronospora</u> <u>parasitica</u> ) (con.)	ferbam	7	—*	D	—	1.7	Apply in plant bed only. Begin at first sign of disease; repeat 2 or 3 times as necessary.	Remove residues by washing or by trimming if application is made within 3 days of harvest.
	maneb	10	3	WP or D	1.2-1.6	Up to 4	Begin in plant bed; re- peat at 3-day intervals. In field, repeat at 7- 14 day intervals.	
	zineb	7	7	WP or D	0.65-1.5	0.6-3.0	Begin when disease threatens; repeat at 7- 10 day intervals.	
<u>Clubroot</u> ( <u>Plasmodiophora</u> <u>brassicae</u> )	PCNB	Extended	—*	WP or D	—	—	Soil treatment: Dosage depends upon method of application - row, band, or broadcast.	

Seed decay and  
Damping-off

(See seed treatment lists - captan, chloranil, and thiram)

<b>BRUSSELS SPROUTS</b>								
<u>Alternaria leaf spot</u> ( <u>Alternaria</u> spp.) and <u>Downy mildew</u> ( <u>Peronospora</u> <u>parasitica</u> )	chloranil	Nonfood use	—*	WP or D	2	0.5-1.7	Apply in plant bed only. Begin 7-10 days after seeding; repeat at 3- 5 day intervals until all usable plants are drawn.	Field planting. (Crops grown for seed only.)
		Nonfood use	NTL	WP or D	1	1.5-2	Begin when plants are set in field, or if direct seeded, begin 7- 10 days after planting. Repeat at 3-7 day inter- vals until seed harvest.	

Continued

\* Does not apply.

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**VEGETABLE DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
<b>BRUSSELS SPROUTS</b>								
<u>Alternaria leaf spot</u> ( <u>Alternaria</u> spp.) and <u>Downy mildew</u> ( <u>Peronospora</u> <u>parasitica</u> ) (con.)	chlorothalonil	5	NTL	WP	--	1.125	Begin after transplants are set in field, or shortly after emergence of field-seeded crop, or when conditions favor disease development.	Alternaria leaf spot --Southeastern States only.
	maneb	10	NTL	WP or D	1.2	Up to 2.6	Begin when disease threatens; repeat at 3- day intervals in plant beds, and at 7-10 day intervals in fields.	
	zineb	7	7	WP or D	0.65-1.5	0.6-3.0	Begin when disease threatens; repeat at 7- 10 day intervals.	
<u>Clubroot</u> ( <u>Plasmodiophora</u> <u>brassicae</u> )	PCNB	Extended	---*	WP or D	--	--	Soil treatment: Dosage depends upon method of application - row, band, or broadcast.	

Seed decay and  
Damping-off

(See seed treatment lists - captan, chloranil, and thiram)

<b>CABBAGE</b>								
<u>Alternaria leaf spot</u> ( <u>Alternaria</u> <u>brassicae</u> )	chloranil	Nonfood use	---*	WP or D	2	0.5-1.7	Apply in plant bed only. Begin 7-10 days after seeding; repeat at 3-5 day intervals until all usable plants are drawn.	

Continued

\* Does not apply.

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## VEGETABLE DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
CABBAGE								
<u>Alternaria leaf spot</u> ( <u>Alternaria</u> <u>brassicae</u> ) (con.)	chloranil	Nonfood use	NTL	WP or D	1	1.5-2	Begin when plants are set in field, or if direct seeded, begin 7-10 days after planting. Repeat at 3-7 day intervals until seed harvest.	Field planting. (Crops grown for seed only.)
	chlorothalonil	5	NTL	WP	--	1.125	Begin after transplants are set in field, or shortly after emergence of field-seeded crop, or when conditions favor disease development.	Southeastern States only.
	maneb	10	7	WP or D	1.2-1.6	1.05-2.6	Begin 7-10 days after planting; repeat at 3-5 day intervals in plant bed and field.	
	zineb	7	7	WP or D	0.65-1.5	0.6-3.0	Begin when disease threatens; repeat at 7-10 day intervals.	
<u>Downy mildew</u> ( <u>Peronospora</u> <u>parasitica</u> )	chloranil	Nonfood use	---*	WP or D	2	0.5-1.7	Apply in plant bed only. Begin 7-10 days after seeding; repeat at 3-5 day intervals until all usable plants are drawn.	
		Nonfood use	NTL	WP or D	1	1.5-2	Begin when plants are set in field, or if direct seeded, begin 7-10 days after planting. Repeat at 3-7 day intervals until seed harvest.	Field planting. (Crops grown for seed only.)
	ferbam	7	---*	WP or D	1.14	1.7	Apply in plant beds only. Begin when plants emerge; repeat 2 or 3 times a week for 3-4 applications.	

Continued

\* Does not apply.

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Use Pesticides Safely—Follow the Label

**VEGETABLE DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
CABBAGE								
Downy mildew ( <u>Peronospora</u> <u>parasitica</u> ) (con.)	maneb	10	7	WP or D	1.2-1.6	1.05-2.6	Begin 7-10 days after planting; repeat at 3-5 day intervals in plant bed and field.	
	zineb	7	7	WP or D	0.65-1.5	0.6-3.0	Begin when disease threatens; repeat at 7- 10 day intervals.	
Clubroot ( <u>Plasmodiophora</u> <u>brassicae</u> )	PCNB	Extended	--*	WP or D	--	--	Soil treatment: Dosage depends upon method of application - row, band, or broadcast.	

Seed decay and  
Damping-off

(See seed treatment lists - captan, chloranil, and thiram)

CANTALOUPE, WATERMELON, PUMPKIN, AND SQUASH								
Downy mildew ( <u>Pseudoperonospora</u> <u>cubensis</u> ) and Anthracnose ( <u>Colletotrichum</u> <u>laganarium</u> )	captafol	5	NTL	WP or FS	--	1.2-2.5	Apply when first true leaves appear; repeat at weekly intervals.	Not registered for use on pumpkins or squash.
	captan	25	NTL	WP or D	1.5	2.0-3.8	Begin at first sign of disease; repeat at 5-7 day intervals.	
	chlorothalonil	5	NTL	WP	--	1.125-1.5	Begin when plants are in first true leaf stage or when conditions favor disease development; repeat at 7-day intervals, more frequently under severe disease conditions.	

Continued

\* Does not apply.

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2.14.10

Use Pesticides Safely—Follow the Label

VEGETABLE DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
CANTALOUPE, WATERMELON, PUMPKIN, AND SQUASH								
Downy mildew ( <i>Pseudoperonospora cubensis</i> ) and Anthracnose ( <i>Colletotrichum lagenarium</i> ) (con.)	ferbam	7	NTL	D	--	0.15-0.8	Begin when plants are small; repeat at 3-5 day intervals.	
	folpet	15	NTL	WP or D	1-2	3	Apply 200 gal./acre beginning when first true leaves appear; repeat at weekly inter- vals.	
	maneb	4	5	WP or D	1.2-1.6	1.1-2.8	Begin when disease threatens or plants be- gin to run; repeat at 7-10 day intervals, or at 3-5 day intervals under severe disease conditions.	
	nabam + zinc sulfate	7	NTL	WP or L	0.86-1.05 nabam + 0.75 zinc sulfate containing 36% metal- lic zinc	--	Begin when vines are 4-6 inches long; repeat at weekly intervals.	Direct sprays especially to lower leaf surfaces.
	zinc ion-maneb complex	4	5	WP	--	1.6-2.4 in sufficient water to cover tho- roughly.	Begin in 2 leaf stage; repeat at 5-7 day inter- vals.	Not registered for use on pumpkin or winter squash.
	zineb	4	5	WP or D	0.65-1.5	0.6-3.0	Begin when plants emerge or begin to vine, or when disease appears.	



**VEGETABLE DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
CANTALOUPE, WATERMELON, PUMPKIN, AND SQUASH								
Powdery mildew ( <i>Erysiphe</i> <i>cichoracearum</i> )	Bay 36205	Extended	21	WP	--	0.25-0.375 in sufficient water for complete coverage/ acre	Begin before disease appears; repeat at 7-14 day intervals, more frequently under severe disease conditions, but no more than 7 times.	For use only on cantaloupe and honey dew melons. Do not use crop for feed or forage purposes.
	dinocap	Extended	7	WP, D or LC	1.5-2 oz. WP or LC	0.2-0.4	Begin when mildew first appears. Do not make more than 3-4 applications to any one set of fruit for summer squash.	
	folpet	15	NTL	WP or D	1-2	3	Apply 200 gal./acre beginning when first true leaves appear; repeat at weekly inter- vals.	

Seed decay and  
Damping-off

(See seed treatment lists - captan, chloranil, thiram, and zineb)

CARROT								
Cercospora leaf spot ( <i>Cercospora carotae</i> ) and Alternaria leaf blight ( <i>Alternaria dauci</i> )	maneb	7	NTL	WP or D	1.2-1.6	0.8-3.0	Begin when plants are 6 weeks old; repeat at 7-10 day intervals.	
	zineb	7	7 if treated tops are to be used as food or feed	WP or D	0.65-1.5	0.6-3.0	Begin when disease threatens; repeat at 7- 10 day intervals.	

**VEGETABLE DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		

CARROT

Seed decay and  
Damping-off

(See seed treatment lists - chloranil and thiram)

CAULIFLOWER								
Alternaria leaf spot ( <u>Alternaria</u> <u>brassicae</u> ) and Downy mildew ( <u>Peronospora</u> <u>parasitica</u> )	chlorothalonil	5	NTL	WP	--	1.125	Begin after transplants are set in field, or shortly after emergence of field-seeded crop, or when conditions favor disease development.	Alternaria leaf spot —Southeastern States only.
	maneb	10	NTL	WP or D	1.2	Up to 2.6	Begin when disease threatens; repeat at 3- day intervals, in plant beds, and at 7-10 day intervals in fields.	
Clubroot ( <u>Plasmodiophora</u> <u>brassicae</u> )	PCNB	Extended	—*	WP or D	--	--	Soil treatment: Dosage depends upon method of application - row, band, or broadcast.	

Seed decay and  
Damping-off

(See seed treatment lists - captan, chloranil, and thiram)

\* Does not apply.

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2.14.13

Use Pesticides Safely—Follow the Label

VEGETABLE DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
CELERY								
Early blight ( <i>Cercospora apii</i> ) and Late blight ( <i>Septoria apii</i> and <i>S. apii-graveolentis</i> )	anilazine	10	NTL	WP or D	1-3/75- 175 gal./ acre	1-2	Begin applications before diseases appear; repeat at 7-10 day intervals or at 4-5 day intervals during prolonged cool, wet weather.	Treated celery should be trimmed and washed.
	maneb	5	14	WP or D	1.2-1.6	1.75-2.8	Begin when plants emerge in plant beds; repeat at 3-5 day intervals in plant beds and at 7-10 day intervals after plants are set in field.	Remove excess residues by stripping, trimming, and washing.
	NIA 9102	5	NTL	WP	1.6	--	Begin when plants are set in the field; repeat at weekly intervals, or at 3-5 day intervals under conditions especially favorable for disease development.	Remove excess residues by stripping, trimming, and washing.
COLLARDS								
Leaf spots ( <i>Alternaria brassicae</i> ) and Downy mildew ( <i>Peronospora parasitica</i> )	chloranil	Nonfood use	--*	WP or D	2	0.5-1.7	Apply in plant bed only. Begin 7-10 days after seeding; repeat at 3-5 day intervals until all usable plants are drawn.	
		Nonfood use	NTL	WP or D	1	1.5-2	Begin when plants are set in field, or if direct seeded, begin 7- 10 days after planting; repeat at 3-7 day inter- vals until seed harvest.	Field planting. (Crops grown for seed only.)

Continued

\* Does not apply.

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Use Pesticides Safely--Follow the Label

**VEGETABLE DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
COLLARDS	zineb	25	7	WP or D	0.65-1.5	0.6-3.0	Begin when disease threatens; repeat at 7- 10 day intervals.	
Leaf spots ( <u>Alternaria</u> <u>brassicae</u> ) and Downy mildew ( <u>Peronospora</u> <u>parasitica</u> ) (con.)								

Seed decay and  
Damping-off

(See seed treatment lists - captan and thiram)

CORN								
------	--	--	--	--	--	--	--	--

(See Sweet Corn)

COWPEA								
--------	--	--	--	--	--	--	--	--

(See Pea, Blackeye)

CUCUMBER	captafol	2	NTL	WP or FS	--	1.125-1.5	Apply when first true leaves appear; repeat at weekly intervals.	
Downy mildew ( <u>Pseudoperonospora</u> <u>cubensis</u> ) and Anthracnose ( <u>Colletotrichum</u> <u>lagenarium</u> ) and other leaf diseases								

Continued

VEGETABLE DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
CUCUMBER								
Downy mildew ( <i>Pseudoperonospora</i> <i>cubensis</i> ) and Anthracnose ( <i>Colletotrichum</i> <i>lagenarium</i> ) and other leaf diseases (con.)	captan	25	NTL	WP or D	1.5	2.5-3.8	Begin at first sign of disease; repeat at 5-7 day intervals.	Direct sprays especially to lower leaf surface.
	chlorothalonil	5	NTL	WP	--	1.125-1.5	Begin when plants are in first true leaf stage; repeat at 7-day intervals.	
	ferbam	7	NTL	D	--	0.15-0.8	Begin when plants are small; repeat at 3-5 day intervals.	
	folpet	15	NTL	WP or D	1-2	3	Begin when first true leaves appear; repeat at weekly intervals.	
	maneb	4	5	WP or D	1.2-1.6	1.2-2.8	Begin when diseases threaten, or plants begin to run; repeat at 7-10 day intervals, or at 3-5 day intervals under severe disease conditions.	
	nabam + zinc sulfate	7	NTL	WP	0.86-1.05 nabam + 0.75 zinc sulfate containing 36% metal- lic zinc	--	Begin when vines are 4-6 inches long; repeat at weekly intervals.	
	zinc ion-maneb complex	4	5	WP	--	1.6-2.4 in sufficient water to cover thoroughly	Begin in 2-leaf stage; repeat at 5-7 day inter- vals.	
	zineb	4	5	WP or D	0.65-1.5	0.6-3.0	Begin when plants emerge or begin to vine, or when diseases appear.	

**VEGETABLE DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
<b>CUCUMBER</b>								
<b>Powdery mildew</b> <b>(<u>Erysiphe</u></b> <b><u>cichoracearum</u>)</b>	Bay 36205	Extended	7	WP	--	0.25-0.375 in sufficient water for complete coverage	Begin before disease appears; repeat at 7-14 day intervals, more frequently under severe disease conditions, but not more than 5 times.	Do not use crop for feed or forage purposes.
	dinocap	Extended	7	WP, D, or LC	1.5-2 oz. WP or LC	0.2-0.4	Begin when mildew first appears. Do not make more than 3-4 applications to any one set of fruit.	
	folpet	15	NTL	WP or D	1-2	3	Apply when first true leaves appear; repeat at weekly intervals.	

Seed decay and  
Damping-off

(See seed treatment lists - captan, chloranil, sodium p-(dimethylamino)benzenediazosulfonate,  
thiram, and zineb)

<b>EGGPLANT</b>								
<b>Anthrachnose</b> <b>(<u>Colletotrichum</u> spp.</b> <b>and</b> <b><u>Gloeosporium</u> spp.),</b> <b>Phomopsis blight</b> <b>(<u>Phomopsis vexans</u>),</b> <b>and Early blight</b> <b>(<u>Alternaria solani</u>)</b>	captan	25	NTL	WP	1	--	Begin when plants emerge in plant bed, or when disease first appears in field; repeat at 3-7 day intervals through growing season.	
	maneb	7	NTL	WP or D	1.2-1.6	1.05-2.8	Begin when fruit starts to form; repeat at 7-10 day intervals.	

Continued

**VEGETABLE DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
EGGPLANT								
Anthracnose ( <i>Colletotrichum</i> spp. and <i>Gloeosporium</i> spp.), Phomopsis blight ( <i>Phomopsis vexans</i> ), and Early blight ( <i>Alternaria solani</i> ) (con.)	zineb	7	NTL	WP or D	0.65-1.5	0.6-3.0	Begin when disease threatens; repeat at 7- 10 day intervals.	
	ziram	7	NTL	WP	1.14-1.52	--	Begin in plant bed when plants emerge; repeat in plant bed and field at 7-10 day intervals, or as necessary.	

Seed decay and  
Damping-off

(See seed treatment lists - chloranil and thiram)

GARLIC								

(See Onion and garlic)

KALE								
Leaf spots ( <i>Alternaria</i> <i>brassicae</i> ) and Downy mildew ( <i>Peronospora</i> <i>parasitica</i> )	zineb	10	10	WP or D	0.65-1.5	0.6-3.0	Begin when plants emerge; repeat as necessary.	

Seed decay and  
Damping-off

(See seed treatment lists - captan, chloranil, and thiram)

**VEGETABLE DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
<b>KOHLRABI</b>								
Leaf spots ( <u>Alternaria brassicae</u> ) and Downy mildew ( <u>Peronospora parasitica</u> )	maneb	10	NTL	WP or D	1.2	Up to 2.6	Begin when disease threatens; repeat at 3- day intervals in plant beds, and at 7-10 day intervals in field.	
	zineb	7	Do not apply after edible parts are half grown	WP or D	0.65-1.5	0.6-3.0	Begin when plants emerge; repeat as necessary.	

Seed decay and  
Damping-off

(See seed treatment list - thiram)

<b>LETTUCE</b>								
Downy mildew ( <u>Bremia lactucae</u> )	maneb	10	10	WP or D	1.2-1.6	1.8-3.2	Begin when disease appears; repeat at 7-10 day intervals.	
	zineb	10	10	WP or D	0.65-1.5	0.6-3.0	Begin in plant beds as a drench; repeat as necessary. In the field, spray or dust at 7-10 day intervals.	



VEGETABLE DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
LETTUCE								
Gray mold ( <i>Botrytis cinerea</i> )	DCNA	10	24	WP or D	2 in 100 or 200 gal./acre	1.8-2	For leaf lettuce in greenhouse, apply 7 days after transplanting; repeat when plants are half mature. For head lettuce in the field, apply at thinning; re- peat 7-10 days later. Or use 4.26 lb. in sufficient water/acre as a single application immediately after thin- ning.	Do not apply to wilted plants or seedlings.
	zineb	10	10	WP or D	0.65-1.5	0.6-3.0	Begin in plant beds as a drench; repeat as necessary. In the field, spray or dust at 7-10 day intervals.	
Drop ( <i>Sclerotinia</i> <i>sclerotiorum</i> )	DCNA (head lettuce)	10	14	WP	2 in 100 or 200 gal./acre	--	Apply at thinning; repeat 7-10 days later. Or use 4.26 lb. in sufficient water/acre as a single application immediately after thinning.	

Seed decay and  
Damping-off

(See seed treatment lists - chloranil, dichlone, and thiram)

MELONS

(See Cantaloup, Watermelon, Pumpkin, and Squash)

**VEGETABLE DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
<b>MUSHROOMS</b>								
<p>Brown spot or Dry bubble (<u>Verticillium malthousei</u>) and Green mold (<u>Trichoderma</u> sp.)</p> <p>Mycogone or Wet bubble (<u>Mycogone perniciosa magnus</u>)</p> <p>Soft mildew or Cobweb (<u>Dactylium dendroides</u>, conidial stage of <u>Hypomyces vosellus</u>)</p>	zineb	7		WP or D	0.75, using 10.0 gal. of spray/4000 sq. ft.	0.07-0.15 as a dust/4000 sq. ft.	Begin soon after casing soil is applied; repeat at 3-7 day intervals until small buttons begin to form, then apply to casing soil between "breaks."	
<b>MUSHROOM BEDS</b>								
Bubbles and spots	formaldehyde	Nonfood use	---	LC	2 gal. (18.0 lb/100 gal. water)	--	In infected beds pick off all mushrooms and allow casing soil to dry thoroughly. Apply 6 to 10 gal. of diluted solution/300 sq. ft. of bed area as a spray. Temperature of house must be at least 65° F. Beds should not be watered and inoculated with spawn until all traces of formaldehyde fumes have disappeared.	

**VEGETABLE DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
MUSHROOM CASING SOIL								
Fungi	chloropicrin	Nonfood use	---*	L	--	5-10 cc/cubic ft. (0.5 to 1.0 lb. actual/cu. yd.)	Water surface after treatment and cover with plastic or wet newspaper for 24 hours.	
MUSTARD GREENS								
Downy mildew ( <u>Peronospora</u> <u>parasitica</u> ) and Alternaria leaf spot ( <u>Alternaria</u> <u>brassicæ</u> )	chloranil	Nonfood use	---*	WP or D	2	0.5-1.7	Apply in plant bed only. Begin 7-10 days after seeding; repeat at 3-5 day intervals until all usable plants are drawn.	
		Nonfood use	NTL	WP or D	1	1.5-2	Begin when plants are set in field, or if direct seeded, begin 7- 10 days after planting; repeat at 3-7 day inter- vals until seed harvest.	Field planting. (Crops grown for seed only.)
	zineb	10	10	WP or D	0.65-1.5	0.6-3.0	Begin when disease threatens; repeat at 7- 10 day intervals.	

Seed decay and  
Damping-off

(See seed treatment lists - captan and thiram)

\* Does not apply.

Issued December 1972

**VEGETABLE DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
<b>ONION AND GARLIC</b>								
<u>Downy mildew</u> ( <u>Peronospora</u> <u>destructor</u> ), <u>Purple blotch</u> ( <u>Alternaria porri</u> ), and <u>Botrytis blight</u> ( <u>Botrytis</u> spp.)	maneb	7	NTL	WP or D	1.2-1.6	1.75-2.8	Onion only. Begin at first sign of disease; repeat at 7-10 day intervals.	Do not apply to exposed bulbs.
	zinc ion-maneb complex	0.5	7	WP	1.6-2.4	—	For dry bulb onion only. Begin when diseases are first reported in area; repeat at 7-day intervals.	
	zineb	7	7-green	WP or D	0.65-1.5	0.6-3.0	Onion only. Begin when diseases threaten; repeat at 7-10 day intervals.	
<u>White rot</u> ( <u>Sclerotium</u> <u>cavivorum</u> )	DCNA	5	—*	WP or D	24-30	15-24	Soil application before seeding and around sets.	Do not plant spinach as follow-up crop in treated soil. Lower rates in North Central States.
<u>Smut</u> ( <u>Urocystis cepulae</u> )	captan (green and bulb preharvest)	50-green 25-dry	NTL	D	—	1.12	Onion only. In mineral soil furrows spaced 18 inches apart.	Limits-1.5 lb./acre for foliar use; 2 lb./acre in pre-planting soil application.
					—	2	In muck soil furrows spaced 18 inches apart. Begin at first sign of disease; repeat at 7-10 day intervals.	

\* Does not apply.

Issued December 1972

# VEGETABLE DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
ONION AND GARLIC								
Seed decay and Damping-off	(See seed treatment lists - captan, HCB, and thiram)							
PEA, BLACKEYE								
Seed decay and Damping-off	(See seed treatment lists - captan, chloranil, and zineb)							
PEA, GARDEN AND FIELD								
Seedling blights, Seed decay, and Damping-off ( <i>Aphanomyces</i> and <i>Pythium</i> spp.)	(See seed treatment lists - captan, chloranil, dichlone, sodium p-(dimethylamino)benzenediazosulfonate, thiram, and zineb)							
PEPPER								
Blue mold ( <i>Peronospora</i> <i>tabacina</i> )	ferbam	7	--*	WP or D	0.76-1.14	0.76-1.14	Plant bed treatment. Begin at first sign of disease; repeat at 10-14 day intervals.	Plant bed treatment only.
	zineb	7	NTL	WP or D	0.65-1.5	0.6-3.0	Begin when disease threatens; repeat at 7- 10 day intervals.	

\* Does not apply.  
Issued December 1972

**VEGETABLE DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
<b>PEPPER</b>								
<b>Bacterial spot (<i>Xanthomonas</i> <i>vesicatoria</i>)</b>	bordeaux mixture	Exempt	NTL	WP	8 copper sulfate + 8 lime	--	Begin in early season when disease is first noticed, or before disease is expected to appear; repeat at 7-14 day intervals as long as necessary.	As a curative dust, use 200 ppm.
	fixed copper (basic copper sulfate)	Exempt	NTL	WP	1.0-2.5	--	Begin before disease appears; repeat at 7-14 day intervals.	
	streptomycin	Extended	--*	WP	5.4 oz./ 200 gal./ acre	--	Apply in plant bed only, when first pair of true leaves appear; repeat at 5-day intervals until transplanting time.	
	zineb	7	NTL	WP or D	0.65-1.5	0.6-3.0	Begin when disease threatens; repeat at 7- 10 day intervals.	
<b>Frogeye spot (<i>Cercospora capsici</i>)</b>	captan	25	NTL	WP	1.5	--	Apply at 3-7 day inter- vals throughout the growing season.	
	maneb	7	NTL	WP or D	1.2-1.6	1.05-2.8	Begin when disease threatens; repeat at 7- 10 day intervals.	
	zineb	7	NTL	WP or D	0.65-1.5	0.6-3.0	Begin when disease threatens; repeat at 7- 10 day intervals.	

\* Does not apply.

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2.14.25

Use Pesticides Safely—Follow the Label

**VEGETABLE DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
<b>PEPPER</b>								
<b>Anthrachnose (<u>Gloeosporium</u> spp.)</b>	<b>captan</b>	25	NTL	WP	1.5	--	Apply at 3-7 day inter- vals throughout the growing season.	
	<b>maneb</b>	7	NTL	WP or D	1.2-1.6	1.05-2.8	Begin when disease threatens; repeat at 7- 10 day intervals.	
	<b>zineb</b>	7	NTL	WP or D	0.65-1.5	0.6-3.0	Begin when disease threatens; repeat at 7- 10 day intervals.	
	<b>ziram</b>	7	NTL	WP	1.14-1.52	--	Begin in plant bed when plants emerge; repeat in plant bed and field at 7-10 day intervals, or as necessary.	
<b>Southern blight (<u>Sclerotium rolfsii</u>)</b>	<b>PCNB</b>	Extended	---*	WP or D	7-7.5	7-7.5/ 14,500 linear ft. of row	Spray or dust open "v" trench before setting transplants. Soil treatment at transplant- ing time.	

Seed decay and  
Damping-off

(See seed treatment lists - captan, dichlone, thiram, and zineb)

<b>POTATO</b>								
<b>Late blight (<u>Phytophthora</u> <u>infestans</u>) and Early blight (<u>Alternaria solani</u>)</b>	<b>captafol</b>	Extended	NTL	WP	0.75-1.6	--	Begin when plants are 6 inches high; repeat at 7-10 day intervals.	

Continued

\* Does not apply.

Issued December 1972

2.14.26

Use Pesticides Safely—Follow the Label

**VEGETABLE DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
POTATO								
Late blight ( <i>Phytophthora</i> <i>infestans</i> ) and Early blight ( <i>Alternaria solani</i> ) (con.)	chlorothalonil	0.1	NTL	WP	--	0.75-1.125	Begin when plants are 6 inches high or when diseases threaten; repeat at 7-10 day intervals.	Under severe conditions use 1.125 lb./acre rate and shorten application interval.
	maneb	0.1	NTL	WP or D	1.2-1.6	1.2-3.92	Begin when plants are 2-6 inches high; repeat at 5-10 day intervals, more frequently under severe late blight con- ditions.	
	NIA 9102	Extended	NTL	WP	0.8-1.6 by ground spray; 3-6 gal./acre by aircraft	--	Begin when plants are 2-6 inches high; repeat at 5-10 day intervals, more frequently under severe disease con- ditions.	
	zinc ion-maneb complex	Extended	NTL	WP or D	0.8-1.6	0.8-1.6	Begin when plants are 4-6 inches high; repeat at 7-10 day intervals, more frequently under severe late blight conditions.	
Scab ( <i>Streptomyces</i> <i>scabies</i> )	NIA 9102	0.5	NTL	D	--	0.07-0.11 per 100 lb. tubers	Apply to cover all sur- faces. Seed piece treat- ment.	Do not use treated seed for food or feed purposes.
PUMPKIN								

(See Cantaloup, Watermelon, Pumpkin, and Squash)



**VEGETABLE DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
<b>RADISH</b>								
Downy mildew ( <i>Peronospora</i> <i>parasitica</i> ) and Leaf spots ( <i>Alternaria</i> spp.)	zineb	7	NTL	WP or D	0.65-1.5	1.0-2.4	Begin when disease threatens; repeat at 7- 10 day intervals.	
<b>RHUBARB (greenhouse)</b>								
Leaf rot (Gray mold) ( <i>Botrytis cinerea</i> )	captan	25	NTL	WP	1	--	Apply following budding, and at weekly intervals until harvest.	
	maneb	10	NTL	WP	1.6	--	Begin 4 weeks before harvest. Make 4 applications at 7-day intervals.	Michigan only.
<b>SPINACH</b>								
Blue mold ( <i>Peronospora effusa</i> ) and White rust ( <i>Albugo occidentalis</i> )	maneb	10	10	WP or D	1.2-1.6	1.0-2.1	Begin when disease appears; repeat at 7-10 day intervals.	Remove excess residues by washing.
	zineb	10	10	WP or D	0.65-1.5	0.6-3.0	Begin when disease threatens; repeat at 7-10 day intervals.	

**VEGETABLE DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		

**SPINACH**

Seed decay and  
Damping-off

(See seed treatment lists - captan, dichlone, sodium p-(dimethylamino)benzenediazosulfonate, thiram, and zineb)

**SQUASH**

(See Cantaloup, Watermelon, Pumpkin, and Squash)

<b>SWEET CORN</b>								
Helminthosporium blight ( <u>Helminthosporium</u> spp.)	maneb	7	NTL	WP	1.2	—	Begin when plants are 6 inches high; repeat at 4-7 day intervals until harvest.	Do not feed treated forage to livestock.
	zineb	7	NTL	WP	0.65-1.5	—	Begin when disease threatens; repeat at 7-10 day intervals.	Do not feed treated forage to dairy animals or animals being finished for slaughter.

Seed decay and  
Damping-off

(Seed seed treatment lists - captan, dichlone, and thiram)

**VEGETABLE DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
SWEETPOTATO								
Black rot ( <i>Ceratocystis fimbriata</i> ) and Stem rot ( <i>Fusarium oxysporum</i> )	chloranil	Nonfood use	---*	WP	6.25-12.5	--	Dip roots or sprouts momentarily, just before planting.	Do not use treated roots for food or feed.
	thiram	Nonfood use	---*	WP	0.75/7.5 gal.	--	Dip roots for 0.5 min. at bedding time. Plant sprouts promptly after treatment.	
TOMATO								
Southern blight ( <i>Sclerotium rolfsii</i> )	PCNB	Extended	---*	WP or D	7-7.5	7-7.5/7300 linear ft. of row for nonstaked plants or/ 10,900 linear ft. of row for staked plants	Spray or dust into open "V" trench before setting transplants.	
Late blight ( <i>Phytophthora infestans</i> ), Early blight ( <i>Alternaria solani</i> ), and Miscellaneous leaf spots	captafol	15	NTL	WP FS	-- --	1.2-2.4 1.25-2.5	Apply when first fruits are well formed or earlier when conditions favor disease develop- ment; repeat at 7-10 day intervals.	Restricted to use on machine harvested tomatoes.
	chlorothalonil	5	NTL	WP	--	1.5-2.25 for anthracnose; 1.125-1.5 for leaf diseases	Begin when disease threatens; repeat at 7-10 day intervals.	

Continued

\* Does not apply.

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**VEGETABLE DISEASES**

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
<b>TOMATO</b>								
Late blight ( <i>Phytophthora</i> <i>infestans</i> ), Early blight ( <i>Alternaria solani</i> ), and Miscellaneous leaf spots (con.)	maneb	4	5	WP or D	1.2-1.6	1.2-4	Begin at first fruit cluster; repeat at 7-10 day intervals.	To avoid damage, do not use on tender, young greenhouse plants.
	NIA 9102	5	NTL	WP	1.2-2.4/ 100-150 gal./acre	--	Begin 10-14 days after field-seeded tomatoes emerge, or soon after transplanting; repeat at 7-10 day intervals, more frequently during periods of rapid growth or con- ditions favorable for disease development.	
	zinc ion-maneb complex	4	5	WP	--	1.2-2.4 in sufficient water for thorough coverage	Begin when seedlings emerge; repeat at 7-day intervals.	
	zineb	4	5	WP or D	0.65-1.5	0.6-3	Begin when first fruit clusters are well formed, or when diseases threaten.	

Seed decay and  
Damping-off  
Anthracnose, and  
Bacterial diseases

(See seed treatment lists - captan, dichlone and thiram)

**TURNIP**

Seed decay and  
Damping-off

(See seed treatment lists - captan, chloranil and thiram)

# VEGETABLE DISEASES

CROP AND DISEASE	FUNGICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
					PER 100 GAL.	PER ACRE		
WATERMELON								

(See Cantaloup, Watermelon, Pumpkin, and Squash)

## SEED TREATMENT LISTS

These lists are alphabetized according to the name of the fungicide, either by the approved common name or, where no common name exists, by the chemical name. Crops are alphabetized in each list and method of application and dosage rate are given opposite each crop.

### Captan Seed Treatments<sup>1</sup>

Crop	Dosage rate for—		
	Slurry method of application	Dry method of application	Planter box application
	<i>Oz. act./100 lb.</i>	<i>Oz. act./100 lb.</i>	<i>Oz. act./100 lb.</i>
Alfalfa . . . . .	2.2 -4.13 <sup>2</sup> 4.2	6.0 <sup>2</sup> 6.0	0.4 ---
Barley . . . . .	0.6 -1.9 <sup>3</sup> 1.5 -3.6 <sup>2</sup> 1.0 ---	0.6 -2.0 <sup>4</sup> 0.8 <sup>2</sup> 1.1 ---	0.8 -2.0 <sup>4</sup> 0.8 -2.4 <sup>3</sup> 1.5 -3.6 <sup>5</sup> 0.8 -1.2
Bean . . . . .	0.8 -1.5 <sup>2</sup> 1.3 <sup>3</sup> 1.25 -3.0 ---	1.5 -1.9 <sup>2</sup> 1.8 ---	0.2 -1.0 <sup>4</sup> 1.0 -2.0 <sup>6</sup> 3.2 -6.3 oz./acre <sup>3</sup> 1.25-2.5 <sup>5</sup> 0.66-1.0
Beet, sugar . . . . .	0.6 -9.6 <sup>2</sup> 3.1	0.6 -9.0 <sup>2</sup> 1.32	---
Beet, table . . . . .	3.4 -6.0 <sup>2</sup> 6.0	9.0 <sup>2</sup> 8.8	---
Bluegrass . . . . .	2.2 -4.13 <sup>2</sup> 4.2	---	---
Broccoli . . . . .	0.4 -1.8	1.13-1.8	---
Brussels sprouts . . . . .	0.4 -1.8	1.13-1.8	---
Cabbage . . . . .	0.4 -1.8	1.13-1.8	0.4

See footnotes at end of table.

### Captan Seed Treatments—con.

Crop	Dosage rate for—		
	Slurry method of application	Dry method of application	Planter box application
	<i>Oz. act./100 lb.</i>	<i>Oz. act./100 lb.</i>	<i>Oz. act./100 lb.</i>
Cantaloup . . . . .	1.15 -1.6 <sup>7</sup> 1.5 <sup>2</sup> 1.54	1.5 -2.25 <sup>7</sup> 1.5 <sup>2</sup> 2.2	0.8 ---
Cauliflower . . . . .	0.4 -1.8	1.8	0.4
Clover . . . . .	2.2 -4.13 <sup>2</sup> 4.2	6.0 <sup>2</sup> 6.0	0.4 ---
Collards . . . . .	0.4	---	---
Corn, field . . . . .	0.5 -1.2 <sup>2</sup> 0.9 <sup>8</sup> 1.13 <sup>3</sup> 1.35 -3.21 ---	0.8 -1.7 <sup>2</sup> 0.9 ---	1.6 -1.8 <sup>4</sup> 1.07-2.14 ---
Corn, sweet . . . . .	0.8 -2.0 <sup>8</sup> 3.75	1.8 -1.9 ---	---
Cotton . . . . .	0.75 -4.0 <sup>2</sup> 0.9 -2.2 ---	1.13-2.7 <sup>2</sup> 1.1 -3.1 ---	---
	---	---	<sup>9</sup> 4.0 -4.8 oz./acre <sup>4</sup> 0.6 -1.2 <sup>6</sup> 3.2 -6.4 oz./acre <sup>10</sup> 4.8 oz./acre
Cowpea . . . . .	0.8 -1.5 <sup>2</sup> 1.3	2.25 <sup>2</sup> 1.8	---
Crucifers . . . . .	0.4 -1.8 <sup>2</sup> 0.8	1.13-1.8 <sup>2</sup> 1.1	0.4 ---
Cucumber . . . . .	0.7 -1.6 <sup>7</sup> 1.5 <sup>2</sup> 1.5	1.5 -2.25 <sup>7</sup> 1.5 <sup>2</sup> 2.2	0.8 ---
Flax . . . . .	1.0 -1.9 ---	1.5 -2.7 <sup>4</sup> 1.6 <sup>2</sup> 2.2	---

See footnotes at end of table.

**Captan Seed Treatments—con.**

Crop	Dosage rate for—		
	Slurry method of application	Dry method of application	Planter box application
	<i>Oz. act./100 lb.</i>	<i>Oz. act./100 lb.</i>	<i>Oz. act./100 lb.</i>
Grasses . . . . .	2.2 -9.0	6.0	---
Kale . . . . .	0.4	---	---
Lespedeza . . . . .	2.2 -4.13	6.0	---
Milo . . . . .	2.0 -3.0	3.0	0.8
Muskmelon . . . . .	0.5 -1.0	1.5	---
Mustard . . . . .	0.4 -2.25	0.3 -10.0	---
Oats . . . . .	0.6 -2.8 <sup>3</sup> 2.25 -5.63 <sup>2</sup> 1.5 ---	0.6 - 3.0 <sup>4</sup> 2.4 <sup>2</sup> 1.65 ---	0.4 -2.0 <sup>4</sup> 1.88-3.75 <sup>3</sup> 2.25-5.63 <sup>5</sup> 1.2 -1.8
Onion (pelleting) . . . . .	---	0.75- 1.0 lb /lb seed	---
Peanut . . . . .	3.0 (in shell) --- --- ---	1.0 - 6.0 <sup>11</sup> 1.2 - 2.25 <sup>3</sup> 1.5 - 2.25 ---	1.0 -3.0 <sup>4</sup> 4.0 <sup>3</sup> 0.75-2.25 <sup>5</sup> 0.4 -0.6
Pea . . . . .	0.8 -1.8 <sup>2</sup> 1.28 <sup>3</sup> 1.25 -3.0 ---	1.8 - 1.9 <sup>2</sup> 1.8 --- ---	0.8 -1.0 <sup>4</sup> 1.0 -2.0 <sup>3</sup> 1.25-3.0 <sup>5</sup> 0.66-1.0
Pepper . . . . .	0.8 -1.5 <sup>2</sup> 1.54	2.25 <sup>2</sup> 2.2	--- ---
Pumpkin . . . . .	0.5 -1.8 <sup>7</sup> 1.5 <sup>2</sup> 1.0	1.5 - 1.8 <sup>7</sup> 1.5 <sup>2</sup> 1.54	--- --- ---

See footnotes at end of table.

**Captan Seed Treatments—con.**

Crop	Dosage rate for—		
	Slurry method of application	Dry method of application	Planter box application
	<i>Oz. act./100 lb.</i>	<i>Oz. act./100 lb.</i>	<i>Oz. act./100 lb.</i>
Rice . . . . .	0.9 -3.75 0.6 -1.6 <sup>3</sup> 1.35 -3.21 --- ---	0.8 - 3.75 0.6 - 1.5 <sup>4</sup> 0.8 --- ---	2.0 -3.5 --- <sup>4</sup> 1.07-2.14 <sup>3</sup> 1.35-3.2 <sup>5</sup> 0.66-1.0
Safflower . . . . .	---	0.3	---
Sesame . . . . .	0.75 -1.0	---	---
Sorghum . . . . .	0.8 -2.3 <sup>2</sup> 1.54	1.0 -3.0 <sup>2</sup> 1.65	0.5 -2.0 <sup>10</sup> 2.4
Soybeans . . . . .	0.7 -1.3 <sup>2</sup> 1.28 <sup>3</sup> 1.34 -3.0 --- ---	0.8 -2.0 <sup>2</sup> 1.8 --- ---	0.4 -1.75 <sup>4</sup> 1.0 -2.0 <sup>3</sup> 1.25-3.0 <sup>5</sup> 0.66-1.0 <sup>10</sup> 1.5
Spinach . . . . .	1.8 -3.0 <sup>2</sup> 3.1	4.5 <sup>2</sup> 4.4	--- ---
Squash . . . . .	0.5 -1.8 <sup>7</sup> 1.5 <sup>2</sup> 1.0	1.5 -1.8 <sup>7</sup> 1.5 <sup>2</sup> 1.54	0.8 --- ---
Sunflower . . . . .	---	0.5	---
Swiss chard . . . . .	3.4 -6.0	9.0	---
Tomato . . . . .	0.8	---	---
Trefoil . . . . .	2.2 -4.13	6.0	---
Turnip . . . . .	0.4	---	---
Watermelon . . . . .	0.5 -1.5 <sup>7</sup> 1.5 <sup>2</sup> 1.0	1.25-1.5 <sup>7</sup> 1.5 <sup>2</sup> 1.54	0.8 --- ---

See footnotes at end of table.

### Captan Seed Treatments—con.

Crop	Dosage rate for—		
	Slurry method of application	Dry method of application	Planter box application
	<i>Oz. act./100 lb.</i>	<i>Oz. act./100 lb.</i>	<i>Oz. act./100 lb.</i>
Wheat . . . . .	0.6 -2.0	0.6 -1.5	0.4 -2.0
	---	<sup>4</sup> 0.33	<sup>4</sup> 1.0 -2.0
	<sup>12</sup> 1.25	<sup>12</sup> 0.7 -1.25	<sup>12</sup> 0.7 -1.25
	<sup>2</sup> 0.825	<sup>2</sup> 0.9	<sup>3</sup> 1.25-3.0
	<sup>3</sup> 1.34 -3.0	---	<sup>5</sup> 0.66-1.0
	---	---	<sup>10</sup> 1.25

<sup>1</sup> Tolerance: None (nonfood use). Do not use treated seed for food, feed, or oil.

<sup>2</sup> In combination with zineb (captan to zineb ratio of 22:21).

<sup>3</sup> In combination with equal amounts of maneb.

<sup>4</sup> In combination with equal amounts of HCB and maneb.

<sup>5</sup> In combination with maneb (maneb to captan ratio of 3.5:1).

<sup>6</sup> In combination with 0.4 to 0.8 oz. actual hexachlorophene/acre.

<sup>7</sup> In combination with 2.1 oz. actual thiram/100 lb.

<sup>8</sup> In combination with equal amounts of thiram.

<sup>9</sup> In combination with equal amounts of folpet.

<sup>10</sup> In combination with equal amounts of PCNB.

<sup>11</sup> In combination with equal amounts of DCNA.

<sup>12</sup> In combination with equal amounts of HCB. Also controls stinking smut (bunt).

### Chloranil Seed Treatments<sup>1</sup>

Crop	Dosage rate for—	
	Slurry method of application	Dry method of application
	<i>Oz. act./100 lb.</i>	<i>Oz. act./100 lb.</i>
Alfalfa . . . . .	3.8	7.4
Bean . . . . .	4.1	4.1
Broccoli . . . . .	7.6	7.6
Broomcorn . . . . .	---	1.9
Brussels sprouts . . . . .	7.6	7.6
Cabbage . . . . .	7.6	7.6
Cantaloup . . . . .	3.8	5.7
Carrot . . . . .	7.6	12.3
Cauliflower . . . . .	7.6	7.6
Clover . . . . .	5.7	6.7
Corn . . . . .	1.9	2.9
Cotton, acid delinted . . . . .	2.9	4.1
Cotton, fuzzy . . . . .	---	5.7
Cotton, machine delinted . . . . .	3.8	2.9
Cowpea . . . . .	2.9	3.8
Cucumber . . . . .	3.8	8.2
Eggplant . . . . .	7.6	7.6
Endive . . . . .	7.6	11.4
Flax . . . . .	3.8	4.1
Kale . . . . .	7.6	7.6
Lettuce . . . . .	7.6	30.4
Oats . . . . .	---	6.0
Okra . . . . .	7.6	7.6
Parsley . . . . .	---	15.2
Parsnip . . . . .	---	19.0
Peanut . . . . .	---	2.9
Pea . . . . .	---	3.1
Pumpkin . . . . .	3.8	7.6
Radish . . . . .	7.6	7.6
Rice . . . . .	1.9	2.4
Sorghum . . . . .	1.9	2.9
Soybeans . . . . .	4.1	<sup>2</sup> 4.1
Squash . . . . .	3.8	7.6
Sudangrass . . . . .	1.9	2.4
Turnip . . . . .	7.6	7.6
Vetch . . . . .	2.9	5.2
Watermelon . . . . .	5.7	5.7

<sup>1</sup> Tolerance: None (nonfood use). Do not use treated seed for food, feed, or oil.

<sup>2</sup> Can also be used at 1.75 to 2.5 oz. act./100 lb. in planter box application.



### Chloroneb Seed Treatments<sup>1</sup>

Crop	Dosage rate for—	
	Slurry method of application	Planter box application
	<i>Oz. act./100 lb.</i>	<i>Oz. act./100 lb.</i>
Bean . . . . .	2.6	3.2
Cotton, acid delinted . . . . .	6.5	8.0
Cotton, fuzzy . . . . .	<sup>2</sup> 4.0	---
Cotton, reginned . . . . .	6.5	8.0
Soybeans . . . . .	2.6	3.2
Sugarbeet . . . . .	3.9	---

<sup>1</sup>Tolerance: 0.1 ppm in or on bean, cottonseed, and soybeans, and in or on roots and tops of sugarbeet; 2.0 ppm in or on forage (vines) of bean, cotton, and soybeans; none (nonfood use) on sugarbeet seed; 0.2 ppm in meat, fat, and meat byproducts of cattle, goats, hogs, horses, and sheep; 0.05 ppm in milk; none required for poultry or eggs. Limitation: Do not use treated seed for food, feed, or oil. Do not graze treated bean or soybeans within 45 days after planting.

<sup>2</sup>In combination with 2.25 oz. actual thiram.

### Dichlone Seed Treatments<sup>1</sup>

Crop	Dosage rate for—	
	Slurry method of application	Dry method of application
	<i>Oz. act./100 lb.</i>	<i>Oz. act./100 lb.</i>
Alfalfa . . . . .	1.5-2.0	1.5-2.0
Beet, table . . . . .	2.0	2.0
Clover . . . . .	2.0	4.0
Corn, field . . . . .	.5	.5
Corn, popcorn and sweet . . . . .	.75	.75
Legumes, small-seeded . . . . .	2.0	4.0
Lettuce . . . . .	2.0	---
Peanut . . . . .	2.0	---
Pea . . . . .	1.0	1.0
Pepper . . . . .	2.0	2.0
Rice . . . . .	1.0	1.0
Sorghum . . . . .	1.0	1.0
Spinach . . . . .	2.0	2.0
Sugarbeet . . . . .	2.0	2.0
Swiss chard . . . . .	2.0	2.0
Tomato . . . . .	2.0	2.0

<sup>1</sup>Tolerance: None (nonfood use). Do not use treated seed for food, feed, or oil.

### HCB (hexachlorobenzene) Seed Treatments<sup>1</sup>

Crop	Diseases	Dosage
Onion (pelleted, Washington State)	smut	0.4 lb./1.0 lb. seed
Sorghum (Colorado)	covered kernel smut, seedling blight.	0.32 to 0.40 oz. act. as a slurry or machine dust; 0.53 oz. act. as farm-applied dust; or 0.75 oz. act. by automatic machine/bu.
Wheat	dwarf bunt, flag smut (Pacific N.W.), stinking smut (bunt).	<sup>2</sup> 0.4 oz. act. as a slurry or flowable formulation; 0.2 oz. act. plus 1.0 oz. actual maneb, slurry or dry/bu., or 1.0-2.0 oz. act. plus equal amounts of captan and maneb, for planter box.
	stinking smut	0.2 to 0.42 oz. act. as a slurry; 0.2 as a dust by machine or 0.53 as a dust by on-farm treatment; or 0.5 oz. act. by automatic machine/bu.

<sup>1</sup>Tolerance: None (nonfood use). Do not use treated seed for food, feed, or oil.

<sup>2</sup>Hexachlorobenzene is also used in combination with captan or maneb on barley, bean, field corn, flax, oats, peanut, rye, and soybeans, wherein the captan or maneb is the active agent.

**Use Pesticides Safely—Follow the Label**

Maneb Seed Treatments<sup>1</sup>

Crop	Diseases	Dosage rate for—	
		Machine application	Planter box application
		<i>Oz. act.</i>	<i>Oz. act.</i>
Barley . . . . .	covered and false loose smuts, damping-off, seed rots, seedlings blights	0.75-2.0/bu. <sup>2</sup> 0.75-1.0/bu.	0.75-2.1/bu. <sup>3</sup> 0.75-1.8/bu. <sup>2</sup> 1.4 -2.1/bu. <sup>3</sup> 0.75-2.0/bu. <sup>4</sup> 0.3 -1.2/bu.
Bean . . . . .	damping-off, seed rots, seedling blights	1.0 -2.0/bu.	1.0 -2.1/bu. <sup>5</sup> 0.75-1.8/bu. <sup>3</sup> 1.4 -2.1/bu. <sup>2</sup> 1.0 -2.0/bu. <sup>4</sup> 0.6 -1.2/bu.
Corn . . . . .	damping-off, seed rots, seedling blights	1.0 -2.0/bu. <sup>2</sup> 1.0/bu.	1.0 -2.1/bu. <sup>5</sup> 0.75-1.8/bu. <sup>3</sup> 1.4 -2.1/bu. <sup>2</sup> 1.0 -2.0/bu. <sup>4</sup> 0.6 -1.2/bu.
Cotton . . . . .	damping-off, seed rots, seedling blights	---	9.60/bu. <sup>2</sup> 1.0 -2.0/100 <sup>4</sup> 0.6 -1.2/100 0.8 -1.6/bu. (acid delinted), or 4.8-8.0/bu. (reginned or <sup>7</sup> fuzzy
Flax . . . . .	damping-off, seed rots, seedling blights	0.75-2.0/bu. <sup>2</sup> 2.0/bu.	1.5 -3.2/bu. <sup>2</sup> 1.5 -2.0/bu. <sup>4</sup> 0.6/bu.
Oats . . . . .	damping-off, seed rots, seedling blights, smuts	0.75-2.0/bu. <sup>2</sup> 0.75-1.0/bu.	0.75-2.1/bu. <sup>5</sup> 0.75-1.8/bu. <sup>3</sup> 1.4 -2.1/bu. <sup>2</sup> 0.75-2.0/bu. <sup>4</sup> 0.3 -1.2/bu.

See footnotes at end of table.

Maneb Seed Treatments<sup>1</sup>—con.

Crop	Diseases	Dosage rate for—	
		Machine application	Planter box application
		<i>Oz. act.</i>	<i>Oz. act.</i>
Peanut . . . . .	damping-off, seed rots, seedling blights	--- <sup>8</sup> 0.75-2.25/100	1.4 -2.1/100 <sup>8</sup> 0.75-2.25/100 <sup>3,6</sup> 1.4 -2.1/100 <sup>4</sup> 0.6 -1.2/100
Pea . . . . .	damping-off, seed rots, seedling blights	1.0 -2.0/bu.	1.0 -2.1/bu. <sup>5</sup> 0.75-1.8/bu. <sup>3</sup> 1.4 -2.1/bu. <sup>2</sup> 1.0 -2.0/bu. <sup>4</sup> 0.6 -1.2/bu.
Rye . . . . .	bunt, damping-off, seed rots, seedling blights	0.75-2.0/bu. <sup>2</sup> 0.75-1.0/bu.	0.75-2.1/bu. <sup>5</sup> 0.75-1.8/bu. <sup>3</sup> 1.4 -2.1/bu. <sup>2</sup> 0.75-2.0/bu. <sup>4</sup> 0.3 -1.2/bu.
Soybeans . . . .	damping-off, seed rots, seedling blights	0.75-2.0/bu.	0.75-2.1/bu. <sup>5</sup> 0.75-1.8/bu. <sup>3</sup> 1.4 -2.1/bu. <sup>2</sup> 1.0 -2.0/bu. <sup>4</sup> 0.6 -1.2/bu.
Sugarbeet . . . .	damping-off, seed rots, seedling blights	4.8 -8.0/100	---
Wheat . . . . .	bunt, damping-off, seed rots, seedling blights	0.75-2.0/bu. <sup>2</sup> 0.75-1.0/bu. <sup>9</sup> 0.5/bu.	0.75-2.1/bu. <sup>5</sup> 0.75-1.8/bu. <sup>3</sup> 1.4 -2.1/bu. <sup>2</sup> 0.75-2.0/bu. <sup>4</sup> 0.15-1.2/bu.

<sup>1</sup> Maneb used as dust formulations only. Tolerance: None (nonfood use). Do not use treated seed for food, feed, or oil.<sup>2</sup> In combination with 0.2 -0.4 oz. actual HCB/bu. or 100 lb. as indicated.<sup>3</sup> In combination with 0.4 -0.6 oz. actual captan/bu. or 100 lb. as indicated.<sup>4</sup> In combination with 0.2 -1.2 oz. actual captan and HCB/bu. or 100 lb. as indicated.<sup>5</sup> In combination with 0.75-1.8 oz. actual captan/bu. or 100 lb. as indicated.<sup>6</sup> In combination with 1.5 -2.1 oz. actual captan/100 lb.<sup>7</sup> In combination with equal amounts of PCNB.<sup>8</sup> In combination with equal amounts of captan.<sup>9</sup> In combination with 0.1 ounce of HCB/bu.

# Sodium p-(dimethylamino)benzenediazosulfonate Seed Treatments<sup>1</sup>

Crop	Diseases and causal organisms	Dosage	
		Oz./100 lb.	
Bean, lima and snap . . . . .	seed rot and damping-off (Aphanomyces, Pythium)	0.7	
Beet, table . . . . .	seed rot and damping-off (Aphanomyces, Pythium)	2.8	
Corn . . . . .	damping-off (Pythium)	0.28-0.56	
Cotton . . . . .	Anthrachnose, damping-off (Pythium)	<sup>2</sup> 1.4 -2.1	
Cucumber . . . . .	seed rot and damping-off (Pythium)	2.1	
Pea . . . . .	seed rot and damping-off (Aphanomyces, Pythium)	0.7	
Sorghum . . . . .	covered kernel smut, damping-off (Pythium)	0.7 -1.4	
Spinach . . . . .	seed rot, damping-off (Aphanomyces, Pythium)	2.8	
Sugarbeet <sup>3</sup> . . . . .	seed rot, damping-off (Aphanomyces, Pythium)	<sup>4</sup> 1.4 -4.2	

<sup>1</sup>Tolerance: None (nonfood use). Do not use treated seed for food, feed, or oil.

<sup>2</sup>Use highest rate only if adequate soil moisture is present to avoid possible injury to seedlings.

<sup>3</sup>Application to sugarbeet by slurry only; all other treatments may be applied by dry mixing or by slurry.

<sup>4</sup>Do not exceed 2.8 ounces actual on seed to be planted in light soils.

# Thiram Seed Treatments<sup>1</sup>

Crop	Dosage rate for—	
	Slurry method of application	Dry method of application
	Oz. act./100 lb.	Oz. act./100 lb.
Barley . . . . .	2.04	2.04
Bean, lima . . . . .	1.4 -1.8	1.5
Bean, snap or dry . . . . .	0.93-1.8	1.0
Beet, table or sugar . . . . .	3.73-4.0	4.0
Broccoli . . . . .	3.73-4.0	4.0
Brussels sprouts . . . . .	3.73-4.0	4.0
Cabbage . . . . .	3.73-4.0	4.0
Cantaloup . . . . .	2.1 -2.5	2.5
Carrot . . . . .	3.73-4.0	4.0
Castor bean . . . . .	2.1 -2.25	2.25
Cauliflower . . . . .	3.73-4.0	4.0
Collards . . . . .	3.73-4.0	4.0
Conifers . . . . .	1.12	---
Corn, field . . . . .	1.25-1.65	1.5
Corn, sweet . . . . .	2.5 -4.0	1.5
Cotton, acid delinted . . . . .	1.89	2.25-3.0
	<sup>2</sup> 2.25	---
Cotton, fuzzy . . . . .	1.89-2.10	2.25
	<sup>2</sup> 2.25	---
Cotton, reginned . . . . .	1.89-2.10	2.25
	<sup>2</sup> 2.25	---
Cowpea . . . . .	0.93-1.0	1.0
Cucumber . . . . .	2.1 -2.25	2.25
Eggplant . . . . .	2.8 -3.0	4.0
Endive . . . . .	3.73-4.0	4.0
Flax . . . . .	2.68	2.68
Grasses . . . . .	3.73-4.0	4.0
Kale . . . . .	3.73-4.0	4.0
Kohlrabi . . . . .	3.73-4.0	4.0
Legumes, small-seeded . . . . .	3.73-4.0	4.0
Lettuce . . . . .	3.73-4.0	4.0
Millet . . . . .	1.86-2.0	3.0
Mustard . . . . .	3.73-4.0	4.0
Okra . . . . .	2.8 -3.0	3.0
Onion . . . . .	3.0	3.0 or 8.0 oz./1.0 lb. pelleted 8.0 oz./10 lb.
Onion, bulb . . . . .	---	8.0 oz./10 lb.

See footnotes at end of table.

### Thiram Seed Treatments<sup>1</sup>—con.

Crop	Dosage rate for—	
	Slurry method of application	Dry method of application
	<i>Oz. act./100 lb.</i>	<i>Oz. act./100 lb.</i>
Onion, set . . . . .	---	8.0 oz./10 lb.
Peanut, shelled . . . . .	2.1 -2.4	2.25
Peanut, unshelled . . . . .	---	1.6
Pea . . . . .	1.4 -1.8	1.5
Pepper . . . . .	3.73-4.0	4.0
Pumpkin . . . . .	2.1 -2.25	2.25
Radish . . . . .	3.73-4.0	4.0
Rice . . . . .	1.55-3.3	2.15
Rye . . . . .	1.84	1.84
Safflower . . . . .	2.0	2.0
Sesame . . . . .	1.4 -1.5	1.5
Sorghum . . . . .	1.66-1.79	1.34
Soybeans . . . . .	0.93-1.8	1.0
Spinach . . . . .	3.73-4.0	4.0
Squash . . . . .	2.1 -2.25	2.25
Swiss chard . . . . .	3.73-4.0	4.0
Tomato . . . . .	2.8 -3.0	4.0
Turnip . . . . .	3.73	4.0
Watermelon . . . . .	2.1 -2.25	2.25
Wheat . . . . .	1.66	1.66

<sup>1</sup>Tolerance: None (nonfood use). Do not use treated seed for food, feed, or oil.

<sup>2</sup>In combination with 4.0 oz. actual chloroneb.

### Zineb Seed Treatments<sup>1</sup>

Crop	Dosage rate for—	
	Slurry method of application	Dry method of application
	<i>Oz. act.</i>	<i>Oz. act.</i>
Alfalfa . . . . .	4.00/100 lb.	5.67/100 lb.
Barley . . . . .	0.47/bu.	0.53/bu.
Bean . . . . .	0.74/bu.	1.05/bu.
Beet, sugar . . . . .	2.94/100 lb.	1.26/100 lb.
Beet, table . . . . .	5.67/100 lb.	8.40/100 lb.
Bluegrass . . . . .	4.00/100 lb.	5.67/100 lb.
Cantaloup . . . . .	1.47/100 lb.	2.10/100 lb.
Clover . . . . .	4.00/100 lb.	5.67/100 lb.
Corn . . . . .	0.47/bu.	0.53/bu.
Cotton, acid delinted . . . . .	0.84/100 lb.	1.05/100 lb.
Cotton, fuzzy . . . . .	1.26/100 lb.	1.47/100 lb.
Cotton, reginned . . . . .	2.10/100 lb.	2.94/100 lb.
Cowpea . . . . .	0.74/bu.	1.05/bu.
Crucifers . . . . .	0.74/100 lb.	1.05/100 lb.
Cucumber . . . . .	1.47/100 lb.	2.10/100 lb.
Flax . . . . .	0.95/bu.	1.26/bu.
Oats . . . . .	0.47/bu.	0.53/bu.
Pea . . . . .	0.74/bu.	1.26/bu.
Pepper . . . . .	1.47/100 lb.	2.10/100 lb.
Pumpkin . . . . .	0.95/100 lb.	1.47/100 lb.
Sorghum, hulled . . . . .	0.74/bu.	0.79/bu.
Soybeans . . . . .	0.74/bu.	1.05/bu.
Spinach . . . . .	2.94/100 lb.	4.20/100 lb.
Squash . . . . .	0.95/100 lb.	1.47/100 lb.
Swiss chard . . . . .	5.67/100 lb.	8.40/100 lb.
Watermelon . . . . .	0.95/100 lb.	1.47/100 lb.
Wheat . . . . .	0.47/bu.	0.52/bu.

<sup>1</sup>Zineb not used alone; formulated as a 21% wettable powder in combination with 22% captan. Tolerance: None (nonfood use). Do not use treated seed for food, feed, or oil.

## INTRODUCTION TO NEMATODE SECTION

Only nematicides registered for specific use under the requirements of the Federal Insecticide, Fungicide, and Rodenticide Act are listed in this handbook. The data are arranged in three major parts: General information on current nematicides; nematicide index, toxicity tables, and summaries; and tables of suggested nematicide uses. All three parts should be consulted before acting on any of these suggestions.

### GENERAL INFORMATION ON CURRENT NEMATOCIDES

Information discussed here concerns the amount of nematode control required, how nematicides work in soil, the toxicity of registered nematicides to warm-blooded animals, and precautions related to nematicide use.

#### Amount of Nematode Control Required

The amount of nematode control required for a given crop is determined by the length of time that control is considered important, the value of the crop, the importance of the control for economical production of the crop, or the need to meet the requirements of certification and quarantine. The most important consideration is economic; optimum nematicide applications are those that result in the most profitable crop value increases in proportion to the expense involved.

For most field and truck crops, a reduction of approximately 85 percent of the nematode population before or at planting will eliminate nematodes as a limiting factor in crop growth for one growing season. In seedbeds, nurseries, orchards, and vineyards, greater control is necessary to provide a longer period of protection. Complete elimination, or eradication, of nematodes from soil is seldom either possible or practical. To satisfy quarantine requirements for dangerous nematode species, it may be necessary to consider treating small amounts of soil by chamber (or space) fumigation or treating plant materials by chamber fumigation, bare-root dips, or soaks, after they have been freed of soil.

The most widely used nematicides are able to diffuse through the soil and are frequently called "soil fumigants." Other nematicides have little or no volatility and do not diffuse through the soil to any appreciable extent. Some nematicides are "soil sterilants" and, in addition to nematodes, control insects, fungi, and weeds.

Nematicidal dosages for row application are based on the amount of nematicide used per linear foot of row. For this reason wide row spacings require less chemical per acre than close row spacings. Dosages for overall applications are those required to treat 1 acre-foot of soil and are not related to the row spacing of crops grown on the land. The suggestions for band and strip applications are calculated on the basis of the proportionate part of an acre that is treated at an overall dosage.

#### How Nematicides Work in Soil

Fumigant nematicides such as DD, EDB, DBCP, and MBR form vapors in the soil, which move several inches from the point of application. Distance of movement is influenced by soil porosity, particle size, soil temperature, soil moisture, and percent colloidal and organic matter.

A number of newer nematicides, especially the organic phosphate and carbamate insecticide-nematicides, have low volatility and cannot be considered as true soil fumigants because the active ingredients do not diffuse through the soil to any significant extent. Dispersion of these chemicals in the soil to insure contact of the nematicide with nematodes in soil spaces depends on mechanical mixing or movement by irrigation water and natural rainfall.

The degree of kill is determined by the concentration of the nematicide in the soil and the length of time the nematodes are exposed to the killing fumes. These factors are seldom under the control of the user, and, in practice, kill can be increased only by increasing the application rate. However, increasing the application rate beyond a certain point does not necessarily result in economically significant increases in nematode kill or crop yield. This relationship is the basis for current dosage suggestions.

The nematicide dosages in this guide are those that have been found by experiment to produce the best crop yield increases with the least amount of nematicide. In most cases the suggested dosage may kill about 85 to 90 percent of the nematodes if conditions of use and application are proper.

If soil moisture is extremely high when nematicides are applied, pore spaces will be filled with water, which restricts diffusion of nematicides. Nematode control is best when the soil moisture is about 80 percent of the field capacity. Under these conditions nematicides move readily in the soil. On the other hand, if soil moisture is low, results will be poor because the chemicals may escape from the soil or decompose before kill is appreciable. The soil temperature should be between 60° and 75° F. for best results.

Clay soils and soils high in organic matter require from 20 to 40 percent more nematicides for effective control than sandy soils. This is because clay

soils have more total pore space to be filled with fumigant vapor than sandy soils and because colloidal and organic matter will often absorb large quantities of some nematicides.

### **Toxicity of Nematicides**

All the nematicides listed in this handbook may be toxic to man and animals, if they are used without proper precautions or under conditions contrary to those stated on product labels. Reading and following the directions on nematicide labels will reduce the potential danger to man and animals, and will also reduce potential dangers, such as persistence as residues in the soil and on plants.

Available toxicity data for registered nematicides are shown on page 3.2.6. The first list contains data on acute oral and dermal (AO and AD) levels, expressed as LD (lethal dosage)<sub>50</sub> values, and acute and chronic vapor toxicity (VA and VC) levels for registered fumigant nematicides. The second list contains data on acute oral and dermal LD<sub>50</sub> values for registered organic phosphate and carbamate nematicides.

Data in these lists are from manufacturers' technical data sheets and from the "Kenaga Index," (Kenaga, E. E. and W. E. Allison. Commercial and Experimental Organic Insecticides (1971 Revision) Separate Publication, Entomol. Soc. America.)

### **Precautions Related to Nematicide Use**

#### **Choice of Nematicides**

The nematicides listed can be considered as available to control plant-parasitic nematodes as preplant soil treatments, as treatments applied at the time of planting, and as postplant treatments applied on and around

established plants. In addition, other related facts are included such as residue tolerances, available formulations, suggested dosage ranges, and time and place treatments may be applied.

The mention of nematode parasites by genus or species or common name indicates that the treatment is specific for those nematodes listed. Where nematode names are not mentioned, the treatment is effective for nematodes in general.

The uses suggested here do not necessarily apply to all areas or parts of the country. In specific production situations, nematicides should be checked with local county agents, State experiment station extension specialists, and manufacturers' technical representatives. They will be able to determine suitability of specific nematicides for specific nematode problems after considering local soil temperature and moisture conditions, cultural practices, and dosage rates.

#### **Safety of Personnel**

The directions and warnings on product labels or in other available literature should be followed to avoid contamination of skin, clothing, and equipment and to avoid swallowing or breathing vapors of any of the nematicidal chemicals in this guide. Proper safety equipment as suggested on product labels and other literature should be worn by operating personnel. This should include goggles, respirators that protect against organic vapors, gloves, coveralls, aprons, and shoe covers. Proper methods of disposing of empty chemical containers, as suggested on product labels and in other literature, should be followed. Products should be stored in original containers in locked cabinets.

**ALWAYS CONSULT PRODUCT LABEL BEFORE USE**

## NEMATICIDE INDEX AND TOXICITY TABLES

The Nematicide Index is a list of registered chemicals referred to in the nematode section of this handbook. The nematicides underlined in the left-hand column are the names that are used in the tables of suggested

nematicide uses. An ® after a name indicates a registered trade name. Approved common names are used when available and are lower case. The chemical name is given for each nematicide, and the index is cross-referenced to indicate additional trade names or other designations.

Acute oral and dermal LD<sub>50</sub> values and/or vapor toxicity values for the nematicides named in the index are in tables on page 3.2.6.

# NEMATICIDE INDEX

Name of Material <sup>1</sup>	Chemical Name (and additional designations)
AC 3911-----	see phorate
AC 18133-----	see thionazin
<u>aldicarb</u> -----	2-methyl-2(methylthio)propionaldehyde O-(methylcarbamoyl) oxime (Temik®, UC 21149)
Alfa-tox®-----	see diazinon
Basudin®-----	see diazinon
<u>Bay 25141</u> -----	O, O-diethyl O-[p-(methylsulfinyl)phenyl] phosphorothioate (Dasanit®, fensulfothion, Terracur P®, S 767)
Bed Fume®-----	see MBR
Bromofume®-----	see EDB
Brom-O-Gas®-----	see MBR
bromomethane-----	see MBR
Brozone®-----	see chloropicrin and MBR
<u>carbofuran</u> -----	2,3-dihydro-2,2-dimethyl-7-benzofuranyl methylcarbamate (Furadan®, NIA 10242)
carbon bisulfide-----	carbon disulfide
<u>carbon disulfide</u> -----	carbon disulfide

<sup>1</sup>See footnote at end of Index.

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Name of Material <sup>1</sup>	Chemical Name (and additional designations)
Chem-Vape®-----	see SMDC
<u>chloropicrin</u> -----	trichloronitromethane (Brozone® (in part), Dowfume® MC-2 (in part), Dowfume® MC-33, Larvacide®, Nemex® (in part), Picfume® in mixture with Telone®, Vorlex®-201 (in part))
Cynem®-----	see thionazin
<u>1,3-D</u> -----	1,3-dichloropropene and related chlori- nated C <sub>3</sub> hydrocarbons (DD (in part), D-D® mixture (in part), Durlone® (in part), Telone®, Vidden® D (in part)), and in mixture with 15% chloropicrin
Dasanit®-----	see Bay 25141
<u>DBCP</u> -----	1,2-dibromo-3-chloropropane, or dibromochloropropane (Fumagon®, Fumazone®, Nemafoam®, Nemagon®, Nemapaz®)
<u>DD</u> -----	1:1 mixture of 1,2-dichloropropane and 1,3-dichloropropane and related chlori- nated C <sub>3</sub> hydrocarbons (D-D® mixture, DD-MENCS (in part), Nemex® (in part), Vidden® D, Vorlex® (in part), Vorlex®- 201 (in part))
<u>DD-MENCS</u> -----	80% DD (see above) + 20% methyl isothio- cyanate (Vorlex®), 68% DD + 17% methyl isothiocyanate + 15% chloropicrin (Vorlex®-201)

<sup>1</sup>See footnote at end of Index.

Use Pesticides Safely—Follow the Label



Name of Material <sup>1</sup>	Chemical Name (and additional designations)
D-D® mixture -----	see DD
<u>demeton</u> -----	mixture of O,O-diethyl S (and O)-[2-(ethylthio)ethyl] phosphorothioates (mercaptophos, Meta-Systox®-R, Systox®)
<u>diazinon</u> -----	O,O-diethyl O-(2-isopropyl-6-methyl-4-pyrimidinyl) phosphorothioate (Alfa-tox®, Basudin®, Diazitol®, Dipofene®, FW 152, G 24480, Gardentox®, Sarolex®, Spectracide®)
Diazitol®-----	see diazinon
dibromochloropropane-----	see DBCP
1,2-dibromo-3-chloropropane -----	see DBCP
1,3-dichloropropene-----	see 1,3-D and DD (in part)
dichloropropene-dichloropropane ----	see DD
Dipofene®-----	see diazinon
Dorlone®-----	see 1,3-D and EDB
Dowfume® MC-2-----	see chloropicrin and MBR
Dowfume® MC-33 -----	see chloropicrin
Dowfume® W-85 -----	see EDB
<u>EDB</u> -----	1,2-dibromoethane or ethylene dibromide (Bromofume®, Dorlone® (in part), Dowfume® W-85, Garden Fume®, Pestmaster® EDB-W85, Soil Fume Caps®, Soilbrom-85®, Soilfume 83®)

<sup>1</sup>See footnote at end of Index.

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Name of Material <sup>1</sup>	Chemical Name (and additional designations)
EP 161-----	see MENCs
ethylene dibromide -----	see EDB
FW 152-----	see diazinon
fensulfuthion-----	see Bay 25141
Fumagon®-----	see DBCP
Fumazone®-----	see DBCP
Furadan®-----	see carbofuran
G 24480 -----	see diazinon
Garden Fume®-----	see EDB
Gardentox®-----	see diazinon
Larvacide®-----	see chloropicrin
<u>MBR</u> -----	monobromomethane or methyl bromide (Bed Fume®, Brom-O-Gas®, Brozone® (in part), Dowfume® MC-2 (in part), Meth-O-Gas®, Panobrome®, Pestmaster®, Weedfume®)
<u>MBR-CP</u> -----	methyl bromide (98%) plus chloropicrin (2%)
MENCs -----	methylisothiocyanate (DD-MENCs (in part), EP 161, Trapex®, Vorlex® (in part), Vorlex®-201 (in part))
mercaptophos-----	see demeton

<sup>1</sup>See footnote at end of Index.

**Use Pesticides Safely—Follow the Label**

Name of Material<sup>1</sup>                      Chemical Name  
(and additional designations)

metam -----see SMDC

Meta-Systox®-R -----see demeton

metham sodium -----see SMDC

Meth-O-Gas® -----see MBR

methyl bromide -----see MBR

methyl isothiocyanate -----see MENCS

Mocap®-----see V-C 9-104

Mycoban®-----see SMDC

Nemacide®-----see V-C 1-13

Nemafos®-----see thionazin

Nemafume® -----see DBCP

Nemagon®-----see DBCP

Nemapaz®-----see DBCP

Nemaphos®-----see thionazin

Nemex®-----see chloropicrin, and DD

NIA 10242 -----see carbofuran

Panobrome®-----see MBR

Penphene® -----see TCTP

<sup>1</sup>See footnote at end of Index.

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Name of Material<sup>1</sup>                      Chemical Name  
(and additional designations)

Pestmaster® ----- see MBR

Pestmaster® EDB-W85 ----- see EDB

phorate ----- O,O-diethyl S-[(ethylthio)methyl]  
phosphorodithioate (AC 3911, Thimet®)

Picfume® ----- see chloropicrin

S 767 ----- see Bay 25141

Sarolex® ----- see diazinon

SMDC ----- sodium N-methyldithiocarbamate  
(Chem-Vape®, metam, metham sodium,  
Mycoban®, Vapam®, VPM, Trimaton®)

Soilbrom-85®----- see EDB

Soilfume 83® ----- see EDB

Soil Fume Caps®----- see EDB

Spectracide® ----- see diazinon

Systox® ----- see demeton

TCTP ----- 2,3,4,5-tetrachlorothiophene or  
tetrachlorothiophene (Penphene®, TD-183)

TD-183 ----- see TCTP

Telone®----- see 1,3-D, and in mixture with 15%  
chloropicrin

<sup>1</sup>See footnote at end of Index.

**Use Pesticides Safely—Follow the Label**

Name of Material <sup>1</sup>	Chemical Name (and additional designations)
Temik®-----	see aldicarb
Terracur P®-----	see Bay 25141
tetrachlorothiophene-----	see TCTP
Thimet®-----	see phorate
thionazin-----	O,O-diethyl O-2-pyrazinyl phosphorothioate (AC 18133, Cynem®, Nemafos®, Nemaphos®, Zinophos®)
Trapex®-----	see MENCS
trichloronitromethane-----	see chloropicrin
Trimaton®-----	see SMDC
UC 21149-----	see aldicarb
Vapam®-----	see SMDC
V-C 1-13-----	O,O-diethyl O-(2,4-dichlorophenyl) phosphorothioate (Nemacide®, V-C 13®, V-C 13 Nemacide®)
V-C 13®-----	see V-C 1-13
V-C 13 Nemacide®-----	see V-C 1-13
V-C 9-104-----	O-ethyl S,S-dipropylphosphorodithioate (Mocap®)

<sup>1</sup>An ® after the name indicates a registered trade name. Common names are used when available and are usually lower case. When more than one name is given, the name underscored is the name used in this Guide.

Name of Material <sup>1</sup>	Chemical Name (and additional designations)
Vidden®D-----	see DD
Vorlex®-----	see DD-MENCS, DD (in part), MENCS (in part)
Vorlex®-201-----	see chloropicrin (in part), DD-MENCS (in part), DD (in part), MENCS (in part)
VPM-----	see SMDC
Weedfume®-----	see MBR
Zinophos®-----	see thionazin

**Use Pesticides Safely--Follow the Label**

## TOXICITY TABLES

Acute oral and dermal levels and acute and chronic vapor toxicity levels for  
registered fumigant nematicides

[All measures are Mg./kg. ]

Nematicide	AO LD <sub>50</sub> <sup>1</sup>	AD LD <sub>50</sub> <sup>1</sup>	VA <sup>2</sup>	VC <sup>2</sup>
carbon disulfide . . . . .	---	---	200	20
chloropicrin . . . . .	---	---	<sup>4</sup> 20	0.1
DBCP . . . . .	173	(rb) 1,420	100	1.0
DD . . . . .	140	2,100	---	---
DD-MENCS (MENCS fraction only) . . .	100	CO <sup>3</sup> ,(m) 30	---	---
1,3-D . . . . .	---	---	500	1.0
EDB . . . . .	108	170	200	25
MBR . . . . .	---	---	200	20
SMDC . . . . .	820,(m) 285	(rb) 800	---	---
TCTP . . . . .	780	256	---	---

<sup>1</sup> Acute oral (AO) and acute dermal (AD) levels expressed as LD<sub>50</sub> values for white rats except for rabbit (rb) and white mouse (m).

<sup>2</sup> Acute vapor (VA) and chronic vapor (VC) toxicity levels for man in ppm.

<sup>3</sup> CO = chronic oral toxicity (90 days or more) no effect level (ppm in diet).

<sup>4</sup> Lethal dose is 0.8 mg./liter on exposure for 30 minutes.

Acute oral and dermal levels for registered organic phosphate and  
carbamate nematicides

[All measures are Mg./kg. ]

Nematicide	AO LD <sub>50</sub> <sup>1</sup>	AD LD <sub>50</sub> <sup>1</sup>
aldicarb . . . . .	1	(rb) 5
Bay 25141 . . . . .	2-11	3-30
carbofuran . . . . .	5	(rb) 885
demeton . . . . .	2-12	8-200
diazinon . . . . .	66-600	379-1,107
phorate . . . . .	1-5	2-7
thionazin . . . . .	9-16	8-15
V-C 1-13 . . . . .	270	(rb) 6,000
V-C 9-104 . . . . .	61	(rb) 26

<sup>1</sup> Acute oral (AO) and acute dermal (AD) levels expressed as LD<sub>50</sub> values for white rats except for rabbit (rb).

## NEMATICIDE SUMMARIES

Three nematicide summaries follow. The first is a list of descriptions of materials. The second is a list of nematicides arranged by time of application. The third is a list of nematicides arranged by crop types and uses, and includes general dose ranges. These summaries are arranged for easy reference and are intended to direct the reader to the third section, the tables of suggested nematicide uses, pages 3.5.1 to 3.11.11.

Several of these registered chemicals are intended to be used alone, and others are component parts of nematocidal mixtures. Information on the amount of nematode control required, how nematicides work in soil, toxicity of nematicides, and precautions related to nematicide uses is discussed above, on pages 3.1.1 to 3.1.2.

### Descriptions of Materials

#### Preplant Nematicides

Most of these chemicals are fumigants and are highly toxic to both plants and fungi, but are discussed here because of their specific ability to kill nematodes in soil before planting. Soil applications with these chemicals are made several weeks to several months before planting to allow proper intervals for nematode kill and for aeration of the soil to avoid phytotoxicity.

*carbon disulfide*.—This fumigant is available as a 100 percent active liquid and weighs 10 pounds per gallon. It is extremely flammable and highly volatile and must be handled with great care. It is not suitable for home garden use.

*chloropicrin* (trichloronitromethane; nitrochloroform).—This fumigant is available as a 99 to 100 percent active liquid and weighs approximately 13.75 pounds per gallon. It may be used alone as a nematicide, or combined with methyl bromide (98 percent methyl bromide plus 2 percent chloropicrin) in several products in which the chloropicrin acts as a warning agent. It may also be combined with other chemicals such as 1,3-D or DD-MENCS. Chloropicrin is a lachrymator and is not suitable for home garden use.

*DD* (a mixture of 1,3-dichloropropene, 1,2-dichloropropane, 3,3-dichloropropene, 2,3-dichloropropene, and related C<sub>3</sub> chlorinated hydrocarbons).—This is available as a 100 percent active liquid soil fumigant, and 1 gallon contains approximately 10 pounds of technical compounds. It is sometimes combined with other compounds such as chloropicrin or methyl

isothiocyanate. Soil applications may be made in the spring or fall or whenever soil temperature, moisture conditions, and weather are suitable.

*1,3-D* (100 percent 1,3-dichloropropene and related chlorinated C<sub>3</sub> hydrocarbons).—This is a liquid soil fumigant and may be used alone or in combination with chloropicrin. One gallon contains approximately 10 pounds of active materials. Soil applications may be made in the spring or fall or whenever soil temperature, moisture conditions, and weather are suitable.

*EDB* (ethylene dibromide; 1,2-dibromoethane).—This liquid soil fumigant is available in various formulations, the most common one being 83 percent by weight active ingredients; 1 gallon of this mixture contains 12 pounds of active ingredient. EDB is also used in combination with other fumigants such as dichloropropane-dichloropropene mixtures and chloropicrin. Soil injections may be made in the spring or fall or whenever soil temperature, moisture conditions, and weather are suitable. EDB should not be used either alone or in combination with rotation and other cultural practices to control cyst nematodes, *Heterodera* spp. It is not highly effective against these nematodes. Do not use it in soils where onion, garlic, and bulb crops are to be grown. If in doubt, consult local production specialists before using EDB.

*MBR* (methyl bromide; dibromomethane).—This chemical, which boils at 41° F., is a gas at normal temperatures and usually is confined in containers under pressure. It may be used alone or in formulations with chloropicrin or ethylene dibromide. It is applied as a liquid by soil injection; as a gas released at the surface under gas-proof covers to previously conditioned soil or other materials; or as a gas applied as a space fumigant to soil, plant parts, and nematode-contaminated material.

*MENCS* (methyl isothiocyanate).—This fumigant is available as a liquid in combination with dichloropropane-dichloropropene mixtures or with the latter plus chloropicrin. Soil injections may be made whenever soil temperature, moisture conditions, and weather are suitable. Treatments in the fall are desirable when planting is planned for early spring.

*SMDC* (sodium N-methyldithiocarbamate).—This fumigant is available as 31 percent and 32.7 percent (anhydrous basis) aqueous solutions. The latter solution contains 3.1 pounds active anhydrous chemical (equal to 4 pounds of the dihydrate) per gallon. It is most effective when sprinkler or flood irrigation is used to distribute SMDC vertically in the soil. Applications may be made by soil injection, drench, or spray in front of a rotary tiller. Distribution of SMDC through the soil is enhanced by adding from 1 to several acre-inches of water after the chemical has been applied.

**TCTP** (tetrachlorothiophene).—This fumigant is available as a 43.4 percent emulsifiable concentrate containing 4 pounds active per gallon. It is for use in soils being prepared for tobacco only.

### Preplant and Postplant Nematicides

The chemicals listed here may be used to treat soils before planting and, under specific circumstances, may be used as a postplant treatment on and around living plants.

**Bay 25141** (O,O-diethyl O-[p-(methylsulfinyl)phenyl] phosphorothioate).—This nonvolatile contact nematicide must be mixed into soil or distributed downward in soil with water to attain best effects. It is available as a 63.5 percent spray concentrate (6 pounds per gallon) or as 10 and 15 percent granular mixtures. It may be used on peanut, sugarcane, and tomato, and also in the commercial production of nonbearing citrus seedlings, ornamentals, and turf. It is not registered for home garden use.

**DBCP** (1,2-dibromo-3-chloropropane).—This fumigant may be used to treat soil before planting, at the time of planting, or as a postplant treatment applied on and around living plants. It is available in solutions, emulsifiable concentrates, granules, and fertilizer mixes. One gallon of the 50 percent by volume technical chemical contains approximately 8.7 pounds of active ingredient. DBCP may be used on many ornamentals, trees, fruit and nut crops, turf, and truck and field crops. Do not use it in soils where onion, garlic, lily, sugarbeet, bell and pimiento peppers, potato, tobacco, and conifers are to be grown. If any doubt exists, consult local or regional production specialists before using DBCP.

**thionazin** (O,O-diethyl O-2-pyrazinyl phosphorothioate).—This chemical is available as a 46.0 percent emulsifiable concentrate containing 4 pounds of active ingredient per gallon and as a 10 percent granular mixture. It is registered for commercial use on cotton, peanut, nonbearing citrus seedlings, white pine, a number of dormant deciduous fruit tree nursery stocks, dormant strawberry nursery stock, and various dormant and nondormant ornamental nursery stocks.

**V-C 1-13** (O,O-diethyl O-(2,4-dichlorophenyl)phosphorothioate).—This chemical is not a fumigant and must be distributed in soil by mixing or by the movement of water. It is available as a 5 percent granular mixture and in liquid formulations containing 7.5 to 8.25 pounds of active ingredient per gallon. It may be used as a preplant treatment and may be applied to established plants. The chemical should be washed off the foliage of treated

plants. Its use is restricted to ornamentals, turf, and soil intended for these crops. It is not suitable for use on food crops.

**V-C 9-104** (O-ethyl S,S-dipropylphosphorodithioate).—This chemical is available as a 10 percent granular mixture for use on banana, peanut, pineapple, soybean, sweetpotato, and tobacco, and soils intended for these crops. It may also be used by commercial or professional personnel on established commercial turf only. It is not registered for use on home lawns. Do not use on newly seeded areas until grass is well established. Do not cut or handle sod or turf for 21 days after treatment.

### Postplant Nematicides

This list also includes those chemicals that can be used at the time of planting. Of the five chemicals listed here, three are restricted to uses on nonfood crops.

**aldicarb** (2-methyl-2(methylthio) propionaldehyde O-(methylcarbamoyl) oxime).—Available as a 10 percent granular mixture, aldicarb is registered for use on lily bulbs and sugarbeets at the time of planting, and as a preplant treatment (except in Michigan) for the latter.

**carbofuran** (2,3-dihydro-2,2-dimethyl-7-benzofuranyl methylcarbamate).—Available as a 10 percent granular mixture, carbofuran is registered for use on sugarcane at the time of planting only.

**demeton** (O,O-diethyl S-(and O)-[2-(ethylthio)ethyl] phosphorothioate).—This chemical is available as an emulsifiable concentrate containing 26.2 percent demeton (2 pounds per gallon) and 2.3 percent related organophosphates. A systemic chemical that penetrates the plant tissue and is translocated, demeton is registered for use on chrysanthemum, daffodil, lily (Croft lily may show toxicity), and primrose to control foliar nematodes.

**diazinon** (O,O-diethyl O-(2-isopropyl-6-methyl-4-pyrimidinyl) phosphorothioate).—This chemical is available as an emulsifiable concentrate containing 46.2 percent diazinon (4 pounds per gallon) formulated in xylene. It is registered for use on turf and lawns. Do not graze livestock in treated areas. Keep children and pets off treated grass until spray has dried.

**phorate** (O,O-diethyl S-[(ethylthio)methyl] phosphorodithioate).—This chemical is available as a 5 or 10 percent granular mixture. It is a systemic chemical and is absorbed by and translocated in the plant. It is registered only for use on Easter lilies grown for bulb production in the Pacific Northwest and may be used by professional nurserymen and florists only. It is not for home use.

## Nematicides Arranged By Time of Application

### Preplant Soil Treatments

aldicarb—sugarbeet only  
Bay 25141—peanut, tobacco, tomato and ornamentals (including some trees) only  
carbon disulfide  
chloropicrin  
DBCP—dibromochloropropane—selected crops  
DD—dichloropropene-dichloropropane mixture  
1,3-D—1,3-dichloropropene  
DD-MENCS—DD plus methyl isothiocyanate  
EDB—ethylene dibromide—selected crops  
MBR—methyl bromide—selected crops  
SMDC—sodium *N*-methyldithiocarbamate  
TCTP—tetrachlorothiophene—tobacco in Southeast United States only  
thionazin—commercial ornamental beds and benches  
V-C 1-13—ornamentals and turf only  
V-C 9-104—pineapple, peanut, soybean, sweetpotato, and tobacco only

### Treatments at Planting Time

aldicarb—sugarbeet and lily bulbs only  
Bay 25141—sugarcane (Florida only) and tobacco, and as a bare-root dip for ornamentals and nonbearing citrus seedlings  
carbofuran—sugarcane only  
DBCP—selected crops  
DD—pineapple only  
1,3-D—pineapple only  
phorate—lily bulb production, Pacific Northwest only  
thionazin—cotton, various dormant deciduous fruit tree nursery stocks, dormant strawberry nursery stock, nonbearing citrus seedlings, and various dormant and nondormant ornamental nursery stocks  
V-C 1-13—ornamental transplants only  
V-C 9-104—peanut, pineapple, soybean, and tobacco only

### Postplant Treatments

Bay 25141—ornamentals and nonbearing citrus seedlings  
demeton—ornamentals only

diazinon—lawn grasses only  
DBCP—selected crops  
EDB—pineapple only  
thionazin—ornamentals, white pine, and nonbearing citrus seedlings  
V-C 1-13—ornamentals and lawn grasses only  
V-C 9-104—bananas and established turf other than home lawns.

**ALWAYS CONSULT PRODUCT LABEL BEFORE USE**

## Nematicides Arranged by Crop Types and Uses

### Bags, Boxes, and Crates

MBR—11 lb./1,000 cu. ft. for 24 hours, space fumigation, in fumigation chamber or under gasproof seal.

### Field Crops

aldicarb—for sugarbeet only. Use in Michigan restricted to treatment at planting time in row. In other areas, use as preplant soil treatment or as treatment at planting time in row.

General range—3 to 4 lb. active/acre for Michigan, 4 to 5 lb. active/acre for other areas.

Bay 25141—Preplant soil treatment and treatment at planting time.

General range—4 to 6 lb. active/acre in 10 to 18 in., bands, 36 to 60 in. row spacing. Disk 4 to 6 in., into soil.

carbofuran—for sugarcane at planting time only.

General range—0.5 lb. active/1,000 linear ft. of row.

DBCP—Preplant soil treatment, treatment at planting time, and postplant treatment.

General range—9 to 26 lb. active/acre: 8 to 13 lb. active in row, 17 to 26 lb. active overall. Not for use in soils where sugarbeet and tobacco are to be grown. If in doubt, consult local production specialists before using DBCP.

DD—Preplant soil treatment.

General range—75 to 200 lb. active/acre in row and 180 to 600 lb. active/acre overall, depending upon type of crop; 300 lb. active/acre overall for *Heterodera* spp., cyst nematodes.

**DD-MENCS**—Preplant soil treatment.

General range—48 to 72 lb. active/acre in row and 145 to 240 lb. active/acre overall.

**1,3-D**—Preplant soil treatment.

General range—60 to 120 lb. active/acre in row and 120 to 240 lb. active/acre overall.

**EDB**—Preplant soil treatment.

General range—27 to 108 lb. active/acre in row and overall.

**MBR**—Preplant soil treatment for seedbeds.

For tobacco plant beds only—1 to 2 lb. active/100 sq. ft. (up to 872 lb. active/acre). Expose to fumigation for 24 to 48 hours. Aerate for 5 to 10 days before seeding.

**SMDC**—Preplant soil treatment.

General range—0.338 lb. (1 pt.) to 0.775 lb. (1 qt.) active/100 sq. ft. for seedbeds sealed with plastic tarp; 1.16 lb. (1.5 qt.) to 1.6 lb. (2 qt.) active/100 sq. ft. with water seal. For tobacco.

**TCTP**—Preplant soil treatment.

General range—3 lb. active/acre in 44-in. row spacing, applied in 5 to 10 gal. of water; 6 to 8 lb. overall applied in 12 to 20 gal. water. Registered for use on tobacco in the Southeastern United States only.

**thionazin**—Soil treatment in row at planting time.

General range—1 lb. active/acre in 12-in. band at planting time. For cotton in North Carolina and South Carolina only.

**V-C 9-104**—Treatment at planting time.

General range—6 to 10 lb. active/acre. For tobacco.

### Flower and Ornamental Crops

**aldicarb**—Treatment at planting time.

General range—5 to 7 lb. active/acre. For lily bulblets only.

**Bay 25141**—Preplant soil (bed, bench, potting) treatment, bare-root dip treatment at planting time, and postplant treatment.

General range—375 to 750 ppm active for 30 minutes as a bare-root dip; 0.9 to 1.8 lb. active/1,000 sq. ft. watered in preplant or postplant drench on beds and benches; 0.5 tsp. of 63.5 percent liquid/2 gal. water in postplant drench on potted plants, using 0.5 pint of this dilute solution per 6-in. pot; 0.05 oz. active as granules/cu. ft. preplant treatment for potting soil.

**chloropicrin**—Preplant soil treatment.

General range—480 to 635 lb. active/acre for field; 0.5 to 1.5 lb. active/cu. yd. for bulk soils.

**demeton**—Postplant soil drench treatment.

General range—0.25 to 0.50 lb. active in 50 gal. of water. Apply 1 pt. of this solution per sq. ft. of bench or bed; use 0.25 pt. of this solution per 6-in. pot for potted plants. Not for home garden use.

**DBCP**—Preplant soil treatment, treatment at planting time, and postplant treatment.

General range—For less tolerant plants, 18 to 26 lb. active per acre preplant or 8 to 17 lb. active/acre postplant; for moderately tolerant plants, 17 to 52 lb. active/acre (8.6 lb. active/acre for newly set roses); for tolerant plants 34 to 86 lb. active/acre. Consult plant lists on product labels to determine tolerances. For potting soil, use 0.12 lb. active/cu. yd., mixed in. Do not use in soils where lily and other bulb crops and conifers are to be grown. If in doubt, consult local production specialists before using DBCP.

**DD**—Preplant soil treatment.

General range—200 to 600 lb. active/acre for planting sites of shallow-rooted plants; up to 1,700 lb. active/acre for planting sites of deep-rooted plants; 300 lb. active/acre for *Heterodera* spp., cyst nematodes.

**DD-MENCS**—Preplant soil treatment.

General range—145 to 240 lb. active/acre overall and planting sites.

**1,3-D**—Preplant soil treatment.

General range—180 to 480 lb. active/acre for overall soil treatment and planting sites of shallow-rooted ornamentals; up to 1,375 lb. active/acre for planting sites of very deep-rooted ornamental shrubs and trees.

**EDB**—Preplant soil treatment.

General range—72 lb. active/acre for nursery and flower crop seedbeds; 180 lb. active/acre for tree-planting sites; 53 lb. EDB in combination with 195 lb. dichloropropenes active/acre overall.

**MBR**—Preplant soil treatment.

General range—1 to 2 lb. active/100 sq. ft. for plant beds; 0.5 to 1 lb. active/cu. yd. for potting soil.



phorate—Treatment at planting time.

General range—10 to 16 lb. active/acre. For Easter lily only.

SMDC—Preplant soil treatment.

General range—233 to 338 lb. active/acre for seedbeds and field treatments for soil injection, sprinkler, and flood irrigation; 0.8 lb. active/100 sq. ft. in basins over planting site, in water sufficient to penetrate up to 6 ft. in some soils.

thionazin—Postplant treatment.

General range—0.38 to 0.76 lb. active in water emulsion sufficient for even distribution over 1,000 sq. ft. or apply as granules at the above rate, for a number of plants (consult product label) including caladium tubers and various dormant and non-dormant nursery stocks.

V-C 1-13—Preplant soil treatment and postplant treatment.

General range—120 to 360 lb. active/acre or 2 lb. active/400 sq. ft. applied in 100 gal. water.

## Fruit and Nut Crops

Bay 25141—Bare-root dip treatment at planting time and postplant treatment.

General range—860 ppm active for 30-minute bare-root dip; 200 mg./8-in. pot. For nonbearing citrus seedlings.

carbon disulfide—Preplant soil treatment.

General range—300 gal. (3,000 lb.) to 500 gal. (5,000 lb.) active/acre.

chloropicrin—Preplant soil treatment.

General range—480 to 635 lb. active/acre overall for fields, tree sites, and nurseries; 0.5 to 1.5 lb. actual/cu. yd. for bulk soil.

DBCP—Preplant soil treatment, at planting time, and postplant treatment.

General range—8 to 138 lb. active/acre. For selected crops only. If in doubt, consult local production specialists before using DBCP.

DD—Preplant soil treatment, except pineapple.

General range—250 to 600 lb. active/acre; up to 1,700 lb. active/acre for planting sites; up to 2,000 lb. active/acre for citrus; 300 to 600 lb. active/acre just before planting or at time of planting of pineapple; 300 lb. active/acre for *Heterodera* spp., cyst nematodes.

DD-MENCS—Preplant soil treatment.

General range—576 to 672 lb. active/acre overall for citrus and orchard tree sites; up to 480 lb. active/acre preplant for grape; 145 to 240 lb. active/acre overall preplant for shallow penetration.

1,3-D—Preplant soil treatment.

General range—202 to 1,375 lb. active/acre; up to 1,920 lb. active/acre for citrus; 300 to 600 lb. active/acre just before planting or at time of planting of pineapple.

EDB—Preplant soil treatment.

General range—180 lb. active/acre overall for fields, tree sites, and nurseries; 108 lb. active/acre overall preplant for strawberry.

MBR—Preplant soil treatment.

General range—Up to 2 lb. active/100 sq. ft.; up to 872 lb. active/acre for fruit tree planting sites in nurseries; 872 lb. active/acre when used alone or in combination with 2 percent chloropicrin for pineapple and strawberry seed and plant beds only. Expose for 48 hours under gasproof seal and aerate a minimum of 3 days before seeding or 5 to 14 days before setting vegetative growth.

SMDC—Preplant soil treatment.

General range—124 to 338 lb. active/acre or 0.388 lb. (1 pt.) to 0.775 lb. (1 qt.)/100 sq. ft. overall.

thionazin—Bare-root dip treatment at planting time and postplant treatment for potted plants.

General range—1 lb. active/100 gal. water for 15-minute bare-root dip for dormant nursery stock of apple, apricot, cherry, peach, pear, plum, and strawberry; 0.8316 lb. active/100 gal. water for 60-minute bare-root dip for nonbearing citrus seedlings; 0.33 lb. active/100 gal. water (400 ppm active ingredient) for potted plant drench to rough lemon and sour orange rootstocks.

V-C 9-104—Preplant soil treatment, treatment at planting time, and postplant treatment.

General range—6 g. active/radius of 0.75 meter overall around producing banana stem; 20 to 40 lb. active/acre overall as preplant treatment or at planting time for pineapple.

## Grass and Turf Crops

Bay 25141—Preplant soil treatment and postplant treatment.

General range—11 to 22 lb. active/acre overall for use in Florida only on bahiagrass, bermudagrass, centipede, St. Augustine grass, and zoysia. For commercial use only.

chloropicrin—Preplant soil treatment.

General range—480 to 635 lb. active/acre overall for field treatment; 0.5 to 1.5 lb. active/cu. yd. for bulk soils.

diazinon—Postplant treatment.

General range—40 to 54 lb. active/acre overall. Apply evenly over surface and follow immediately with 0.5 to 1.0 acre-inch of water.

DBCP—Preplant soil treatment or postplant treatment.

General range—43 to 86 lb. active/acre overall.

DD—Preplant soil treatment.

General range—200 to 600 lb. active/acre overall; 300 lb. active/acre overall for *Heterodera* spp., cyst nematodes.

DD-MENCS—Preplant soil treatment.

General range—145 to 240 lb. active/acre overall.

1,3-D—Preplant soil treatment.

General range—160 to 486 lb. active/acre overall.

MBR—Preplant soil treatment for turf and lawn beds.

General range—1 to 2 lb. active/100 sq. ft. overall. Expose 24 to 48 hours under gasproof cover and aerate for at least 2 days before seeding or 6 to 10 days before setting plants.

SMDC—Preplant soil treatment for lawn seedbeds.

General range—233 to 338 lb. active/acre overall.

V-C 1-13—Postplant soil treatment.

General range—116 lb. active/acre overall, equal to 1 lb. (equal to 1 pt. of 75 percent active) in 10 gal. water/375 sq. ft. in sufficient water to penetrate at least 3 in. into soil. For lawn seedbeds, same dosage, tilled 6 in. deep after application. Wait 14 days before seeding. For grasses.

V-C 9-104—Postplant soil treatment.

General range—20 to 30 lb. active/acre overall. Follow with 1/2 acre-inch of water. For established turf. Not for home lawn use.

## Oilseed and Industrial Crops

DBCP—Preplant soil treatment and treatment at planting time.

General range—8.6 lb. active/12,400 linear ft. of row; 17 to 26 lb. active/acre overall. For peanut.

DD—Preplant soil treatment.

General range—75 to 200 lb. active/acre in row and 150 to 600 lb. active/acre overall; 300 lb. active/acre for *Heterodera* spp., cyst nematodes.

DD-MENCS—Preplant soil treatment.

General range—48 to 72 lb. active/acre in row; 145 to 240 lb. active/acre overall.

1,3-D—Preplant soil treatment.

General range—60 to 160 lb. active/acre in row; 120 to 480 lb. active/acre overall.

EDB—Preplant soil treatment.

General range—36 lb. active/acre in row; 56 to 108 lb. active/acre overall. For peanut.

V-C 9-104—Preplant soil treatment in row within 1 week of planting, and at planting time.

General range—3 to 4 lb. active/acre or 0.025 to 0.033 lb. active/acre/100 linear ft. of row. Apply as 10- to 18-in. band and mix into top 3 to 6 in. of soil. For peanut and soybean.

## Planting Sites for Deep-Rooted Plants

These preplant nematicide treatments are to prepare specific planting sites for the growth of deep-rooted plants. Such preparation usually requires greater-than-ordinary penetration. This category includes many fruit and nut crops, tree crops, and deep-rooted ornamentals.

carbon disulfide

General range—300 gal. (3,000 lb.) to 500 gal. (5,000 lb.) active/acre.

chloropicrin

General range—When used alone, 480 to 1,076 lb. active/acre or 0.5 to 1.5 lb. active/cu. yd. for bulk soils.

DD

General range—200 to 600 lb. active/acre for flowers and ornamentals; 250 to 1,700 lb. active/acre for deciduous fruit and nut crops and grapes; up to 2,000 lb. active/acre for citrus trees; 300 lb. active/acre for *Heterodera* spp., cyst nematodes.

#### DD-MENCs

General range—576 to 672 lb. active/acre for citrus and orchard trees.

#### 1,3-D

General range—200 to 1,375 lb. active/acre for deciduous fruit and nut trees, forest trees, and deep-rooted ornamentals. Up to 1,920 lb. active/acre for citrus trees; 480 lb. active/acre for grapes.

#### EDB

General range—72 to 180 lb. active/acre when used alone; 53 lb. EDB in combination with 195 lb. dichloropropenes active/acre. Not for control of *Heterodera* spp., cyst nematodes.

#### MBR

General range—Up to 872 lb. active/acre, preplant soil treatment when used alone or in combination with 2 percent chloropicrin for fruit tree sites or in nurseries only. Cover treated soil with gasproof cover for at least 48 hours for soil temperatures at 60° F., or 3 to 4 days for soil temperatures below 60°. Aerate 7 to 10 days before planting; 0.4 to 0.7 lb. active/100 sq. ft. for southern pine and red cedar. For use on other crops, see listings under Field Crops, Fruit and Nut Crops, and Vegetable Crops. If in doubt consult local production specialists before using MBR.

#### SMDC

General range—0.7816 lb. active/100 sq. ft. added to the basin of planting site in water. Use water sufficient to penetrate up to 6 ft. in some soils.

#### Planting Sites for Shallow-Rooted Plants

These preplant nematicide treatments are to prepare soil for shallow-rooted plants, chiefly annuals. Most chemicals listed here are fumigants.

#### Bay 25141

General range—11 to 22 lb. active/acre for turf in Florida only; 40 to 81 lb. active/acre for ornamentals; 4 to 6 lb. active/acre in row for tobacco; 0.05 oz. active granules/1 cu. ft. for potting soil.

#### carbon disulfide

General range—300 gal. (3,000 lb.) to 500 gal. (5,000 lb.) active/acre.

#### chloropicrin

General range—When used alone, 480 to 635 lb. active/acre or 0.5 to 1.5 lb. active/cu. yd. for bulk soils.

#### DBCP

General range—Wide range of dosages, from 4.3 lb. active/acre to 86 lb. active/acre overall for some vegetables and ornamentals and 138 lb. active/acre overall for pineapple. Do not use DBCP in soils where bell and pimiento peppers, onion, garlic, lily, potato, sugarbeet, tobacco, and conifers are to be grown. If in doubt, consult local production specialists before using DBCP.

#### DD

General range—75 to 600 lb. active/acre; 300 lb. active/acre for *Heterodera* spp., cyst nematodes.

#### DD-MENCs

General range—48 to 72 lb. active/acre in row; 145 to 240 lb. active/acre overall for food crops; 145 to 240 lb. active/acre overall for flowers, ornamentals, grass, and turf.

#### 1,3-D

General range—60 to 486 lb. active/acre.

#### EDB

General range—24 to 54 lb. active/acre in row; 54 to 108 lb. active/acre overall. Not for control of *Heterodera* spp., cyst nematodes. Do not use in soils where onion, garlic, lily, and other bulb crops are to be grown. If in doubt, consult local production specialists before using EDB.

#### MBR

General range—1 to 2 lb. active/100 sq. ft. or up to 872 lb. active/acre applied at soil surface under gasproof tarp for 48 hours, when used alone or in combination with 2 percent chloropicrin, for nonfood crops or for propagating beds, for broccoli, cauliflower, eggplant, pepper, pineapple, strawberry, and tomato; 412 lb. active/acre for fruit-tree planting sites in nurseries; 240 lb. active/acre for 48 hours under gasproof seal, aerating 7 to 14 days before planting for field treatment of strawberry and tomato; 0.5 to 1 lb. active/cu. yd. of soil and compost for ornamentals; 150 to 872 lb. active/acre for planting sites and propagating beds.

## SMDC

General range—120 to 310 lb. active/acre for field treatments; 0.33 to 0.85 lb. active/100 sq. ft. for seedbeds.

## TCTP

General range—3 lb. active/acre in row; 6 to 8 lb. active/acre overall for tobacco in Southeastern United States only.

## V-C 1-13

General range—15 to 45 gal. active/acre (equal to 120 to 360 lb. active/acre); or 2 lb. actual (1 qt.)/400 sq. ft. (equal to 218 lb. active/acre) for flower beds, ornamental shrubs, and trees; 116 lb. active/acre (equal to 1 lb. in 10 gal. water) for grass and turf.

## Tree Crops

Bay 25141—Preplant soil treatment, bare-root dip treatment at planting time, and postplant treatment.

General range—0.05 oz. 10 percent granules/cu. ft. as a preplant potting soil treatment; 375 to 750 ppm for 30 minutes as a bare-root dip for ornamental trees; 0.9 to 1.8 lb. active/1,000 sq. ft. watered in as a postplant drench on beds and benches; 0.5 tsp. of 63.5 percent liquid/2 gal. water, using 0.5 pint of this dilute solution per 6-in. pot as a postplant drench on potted plants.

DBCP—Preplant soil treatment and postplant treatment.

General range—34 to 86 lb. active overall/acre; 8 to 26 lb. active/acre for less tolerant plants such as magnolia. Do not use in soils where conifers are to be grown. If in doubt, consult local production specialists before using DBCP.

DD—Preplant soil treatment.

General range—200 to 1,700 lb. active/acre for planting sites; 300 lb. active/acre for *Heterodera* spp., cyst nematodes.

DD-MENCS—Preplant soil treatment.

General range—145 to 240 lb. active/acre for tree sites and seedbeds.

1,3-D—Preplant soil treatment.

General range—202 to 1,375 lb. active/acre for planting sites.

EDB—Preplant soil treatment.

General range—72 to 180 lb. active/acre overall for seedbeds and planting sites when used alone; 53 lb. EDB in combination with 195 lb. dichloropropenes active/acre overall.

MBR—Preplant soil treatment.

General range—1 to 2 lb./100 sq. ft. for ornamental, shade, or forest tree crops or 412 lb. active/acre for fruit tree sites in nurseries when used alone or in combination with chloropicrin; 0.4 to 0.7 lb. active/100 sq. ft. for some crops such as southern pine and red cedar. Requires gasproof seal for 48 hours. MBR may affect mycorrhizae in many soils. If in doubt, consult local production specialists before using MBR.

SMDC—Preplant soil treatment.

General range—0.775 lb. active/100 sq. ft., added to the basin of planting site in water sufficient to penetrate up to 6 ft. in some soils.

thionazin—Postplant soil treatment.

General range—0.38 to 0.76 lb. active/1,000 sq. ft. in water, adding 1 acre-inch of water by sprinkler irrigation, for white pine for ornamental purposes only.

## Vegetable Crops

Bay 25141—Preplant soil treatment.

General range—10 to 20 lb. active/acre for tomato. Plant after Bay 25141 has been incorporated into the soil.

chloropicrin—Preplant soil treatment.

General range—480 to 635 lb. active/acre for seedbed soil; 0.5 to 1.5 lb. per cu. yd. for bulk treatment of rooting soil; 1,021 lb. active/acre for celery seedbeds in Florida only.

DBCP—Preplant soil treatment, treatment at planting time, and postplant treatment.

General range—5.7 to 26 lb. active/acre overall and in row (low dosages for row treatments); 0.67 to 1 lb. active/1,000 linear ft. of row for preplant treatment or treatment at planting time; and 26 lb. active/acre overall for preplant treatment for melons. DBCP is not for use in soils where bell or pimiento peppers, onion, garlic, and potato are to be grown. Do not use postplant treatment for melons. If in doubt, consult local production specialists before using DBCP.

DD—Preplant soil treatment.

General range—75 to 200 lb. active/acre in row; 150 to 600 lb. active/acre overall (low dosages for mineral soils, high for muck and peat soils); 300 lb. active/acre overall for *Heterodera* spp., cyst nematodes.

**DD-MENCS—Preplant soil treatment.**

General range—48 to 72 lb. active/acre in row; 145 to 240 lb. active/acre overall.

**1,3-D—Preplant soil treatment.**

General range—60 to 80 lb. active/acre in row; 120 to 480 lb. active/acre overall (low dosage for mineral soils, high for muck and peat soils).

**EDB—Preplant soil treatment.**

General range—24 to 36 lb. active/acre in row and 54 to 108 lb. active/acre overall; when used alone; 54 to 90 lb. active/acre overall for potato; not for control of *Heterodera* spp., cyst nematodes; in combination, 53 lb. active EDB with 195 lb. active dichloropropenes/acre overall applications. Not recommended for use in soils where onion and garlic are to be grown.

**MBR—Preplant seedbed and plant bed treatment.**

General range—1 to 2 lb. active/100 sq. ft. (up to 872 lb. active/acre for tomato seedbeds). Expose to fumigation at least 24 hours (up to 48 hours). Aerate a minimum of 3 days before seeding or 5 to 10 days before setting vegetative growth. For broccoli, cauliflower, eggplant, muskmelon, pepper, and tomato.

**SMDC—Preplant soil treatment.**

General range—233 to 338 lb. active/acre (0.75 to 1.0 qt./100 sq. ft.) for seedbeds and field use.

**V-C 9-104—Preplant soil treatment.**

General range—3 to 4 lb. active/acre in row for sweetpotato.

## **TABLES OF SUGGESTED NEMATICIDE USES**

Nematicide information is arranged under crop headings that are arranged alphabetically under the following general categories: Field Crops, Flower

and Ornamental Crops, Fruit and Nut Crops, Grass and Turf Crops, Oilseed and Industrial Crops, Tree Crops, and Vegetable Crops. For an explanation of these tables, see page 1.4 in Section 1 of this guide.

**FIELD CROPS**

CROP	NEMATICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
COTTON	DBCP	25 in seed		L or G	17-26  9-18/12,400 linear ft. of row.	Preplant, at planting time overall.  Preplant, at planting time, postplant in row.	Apply by chisel injec- tion, furrow irrigation, or as granules in fertilizer mixes. When used as granules, apply recommended dosage. Do not adjust application rates to meet specific fertilizer requirements.
	DD	Nonfood use		L	180-250  75-100	Preplant overall.  Preplant in row.	Wait 10-14 days before planting, longer in case of heavy rains or temper- atures below 60° F.
	DD-MENCS	Nonfood use		L	48-72	Preplant in row.	Apply 8-12 inches deep in furrow; cover with listed bed of soil; wait 14-21 days before planting, longer in case of heavy rains or temperatures below 60° F.
	1,3-D	Nonfood use		L	120-200  60-80	Preplant overall.  Preplant in row.	Allow at least 10-14 days between treatment and planting, longer in case of heavy rains or temper- atures below 60° F.
	EDB	25		L	80-108  27-54	Preplant overall.  Preplant in row.	Wait 7-14 days before planting, longer in case of heavy rains or temper- atures below 60° F.
Continued							

## FIELD CROPS

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## FIELD CROPS

CROP	NEMATOCIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
SUGARBEET  (con.)	DD	Nonfood use		L	230-250	Preplant overall.	For control of root-knot nematodes. Allow 14-21 days before planting, depending on soil type and temperature.
					80-90	Preplant in row.	
					250-300	Preplant overall.	For control of the sugar-beet nematode. Allow 21 days before planting, longer in case of extremely wet conditions or temperature below 60° F.
					150-200	Preplant in row.	
	DD-MENCs  1,3-D	Nonfood use		L	184-200	Preplant overall.	Treatment as for Cotton.  For control of root-knot nematodes. Allow 14-21 days before planting, depending on soil type and temperature.
		Nonfood use			72	Preplant in row.	
SUGARCANE	Bay 25141	0.02		G	200-240	Preplant overall.	For control of sugarbeet nematode. Allow 21 days before planting, longer in case of extremely wet conditions or temperatures below 60° F.
					120	Preplant in row.	
Continued	carbofuran	0.1		G	5.0 (60-inch row spacing), or 0.57/1000 linear ft. of row, any spacing.	At planting time in row.	Apply as 12-18 inch band directly over seed pieces just before closing furrow. Do not place treated zones closer together than 6 inches. Use restricted to Florida.
					0.5/1000 linear ft. of row.	At planting time in row.	Apply as a 15-inch band directly over seed pieces before closing furrow. Do not use in Hawaii.

## FIELD CROPS

CROP	NEMATICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
SUGARCANE (con.)	DD	Nonfood use		L	200-250	Preplant overall for mineral soils.	Allow 7 days for each 100 lb. applied before planting.
					300-600	Preplant overall for muck or peat soils.	Allow 3 months before planting treated muck soils.
TOBACCO	Bay 25141	Nonfood use		L or G	4	Immediately before planting in 10-12 inch band over 48-inch row.	Disk or rototill material 4-6 inches deep and plant.
					6	Immediately before planting in furrow or in 16-inch band on 48-inch row.	For bands, disk or rototill material 4-6 inches deep and plant. Stir into furrow and cover with listed bed.
	DD	Nonfood use					Treatment as for Cotton.
	DD-MENCS	Nonfood use		L	145-240	Preplant overall.	Allow 4-7 days' exposure, with or without tarp; after exposure period aerate by cultivation; then wait 10-21 days before planting.
					48-72	Preplant in row.	Apply 8-12 inches deep in furrow; cover with listed bed of soil; wait 14-21 days before planting, longer in case of heavy rains or temperatures below 60° F.
	1,3-D	Nonfood use					Treatment as for Cotton.
Continued	EDB	Nonfood use					Treatment as for Cotton.

## FIELD CROPS

CROP	NEMATOCIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
TOBACCO (con.)	MBR	Nonfood use		100% L or 98% L in comb. with 2% chloropicrin	1-2/100 sq. ft.	Preplant for seedbeds, released at soil surface; 30-40% less chemical needed if chisel injected.	This application is equal to 435-872 lb./ acre. Keep plastic cover in place 24-48 hours; remove and aerate for at least 2 days before seeding.
	SMDC	Nonfood use		L	1.16 lb. (1.5 pt.)- 1.6 lb. (2 qts.) actual/100 sq. ft.	Preplant for seedbeds as drench; add water to seal in chemical.	Wait at least 21 days before seeding.
	TCTP	Nonfood use		L	0.338 lb. (1 pt.)- 0.775 lb. (1 qt.) actual/100 sq. ft.	Preplant for seedbeds as drench; cover with plastic tarp.	Keep plastic cover in place 24-48 hours; remove and wait at least 21 days before seeding.
	V-C 9-104	Nonfood use		G	6-8  3  6 (equal to 0.05 lb./100 linear ft. of row).  6-10	Preplant overall, apply with 12-20 gal. water/ acre.  Preplant in row (based on 44-inch row spacing); apply with 5-10 gal. water/acre.  Applied in band 18-24 inches wide on row, immediately before plant- ing.  Overall, immediately before planting.	For use in the South- eastern United States only. Wait 14-21 days before planting, longer in case of heavy rains or temperatures below 60° F.  Treatment may be made any time from 7 days preplant to time of planting. Mix 4-6 inches deep, using tiller or harrow.  Mix in top 3 to 6 inches of soil, apply fertilizer and then shape beds. Limit is 10 lb./acre.

**FLOWER AND ORNAMENTAL CROPS**

CROP	NEMATOCIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
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**GENERAL FLOWER AND ORNAMENTAL USES**

Some chemicals, listed first in this section of the table, can be considered for their use as nematocides for preplant treatments in soil in which flower and ornamental crops are to be grown, or for postplant treatments on and around established plants. General conditions of use of these nematocides are similar for all these crops, and the nematocides do not require tolerances. Other chemicals, listed under the various flower and ornamental crops, can also be considered for use as nematocides, but these require more specific conditions of use or tolerances, or both. Consult local production specialists before proceeding with treatments.

	chloropicrin	Nonfood use		L	480-635	Preplant for fields.	Exposure period 24-48 hours.
					0.5-1.5/cu. yd.	Preplant for bulk soils.	Aerate 7-14 days before planting. Max. 1076 lb./acre.
	DD	Nonfood use		L	200-600	Preplant for shallow-rooted plants.	Limit 600 lb./acre. Wait 7 days before planting for each 100 lb. applied, longer in case of heavy rains or temperatures below 60° F.
					Up to 1700	Preplant for sites of deep-rooted ornamental shrubs and trees.	
	DD-MENCs	Nonfood use		L	145-240	Preplant overall for planting sites.	Exposure period 4-7 days when soil temperature is 60° F. or higher and 7-21 days when temperatures are lower. Tarp or water seal may be used. After exposure period, aerate by cultivation or disking. Aerate 7 days for each 115 lb. (12 gal.) used.
	1,3-D	Nonfood use		L	180-480	Preplant overall for floral crops and for sites of shallow-rooted ornamental shrubs and trees.	Allow at least 14-21 days between treatment and planting. Max. 250 lb./acre on mineral soils.

Continued

FLOWER AND ORNAMENTAL CROPS

CROP	NEMATOCIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
	1,3-D				Up to 1375	Preplant, planting sites (upper part of range for trees and deep-rooted ornamental shrubs).	Allow 3-6 months before planting at maximum dosage.
	EDB	Nonfood use		L	72-180	Preplant overall, plant- ing sites, seedbeds.	Exposure period 7-10 days or longer. Aerate 3-6 months before plant- ing.
	MBR	Nonfood use		L in combination with dichloro- propenes.  100% L or 98% L in combination with 2% chloropicrin.	53 EDB in combi- nations with 195 dichloropropenes.  1-2/100 sq. ft.  0.5-1/cu. yd.	Preplant overall.  Preplant overall for plant beds.  Preplant for potting soil.	Allow 14-21 days before planting.  Growing difficulties may be experienced with Carnations, Conifers, Delphinium, Holly, Snap- dragon, and certain other crops. Consult local authorities before using. Not for home garden use.
	SMDC	Nonfood use		L	233-338  0.8/100 sq. ft.	Preplant overall for field and seedbeds.  Preplant for tree plant- ing sites.	For soil injection, sprinkler, flood irri- gation. Plastic tarps can be used. Cultivate 5-7 days after appli- cation; plant 1-2 weeks later.  Make shallow basin over planting site and add chemical to stream of water, filling basin. Use sufficient water to penetrate 6 feet deep. Wait 4 weeks before planting, longer if soil temperatures are below 60° F.

Continued

CROP	NEMATICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
	thionazin	Nonfood use		L	1.0/100 gal. of water (= to 1200 ppm).	Bare root dip.	For treatment of various dormant nursery stocks. Immerse bare roots only for 15 minutes. Allow to drip dry before handling. For commercial use only. Check with local or regional production specialists before using this treat- ment.
		Nonfood use		L or G	0.38-0.7/1000 sq. ft.	Preplant and postplant bed and bench drenches.	For treatment of various nondormant nursery stocks.  Sprinkle irrigate with 1 acre-inch of water immediately after treat- ment. Do not disturb soil for 14 days afterwards. Repeat in 6 months if necessary. For commercial use only.
					1.3 pints of 4.0 lb. emulsion concentrate/100 gal. of water (= to 800 ppm).	Bare root dip.	Immerse bare roots only for 30 minutes. Allow to drip dry before handling. For commercial use only.
						Balled or potted plant soaks.	Soak plants for 30 minutes. Remove and drain thoroughly. For commercial use only.
						Potted plant drenches.	Allow solution to saturate the soil. Soil must be moist before treatment. For commercial use only. Check with local or regional production specialists before using these treatments.
				END OF GENERAL STATEMENT			

FLOWER AND ORNAMENTAL CROPS

CROP	NEMATICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
ACHILLEA	DBCP	Nonfood use		L	34-86	Preplant, at planting time, postplant: overall or in row.	Wait 7-14 days before planting for shallow- rooted plants, 4-6 months for deep-rooted plants.
AFRICAN VIOLET	DBCP	Nonfood use		L or G	17-52 0.12 granules/ cu. yd. potting soil.	Preplant, postplant, overall.	For potted plant or soil treatment.
	V-C 1-13	Nonfood use		L	120-360 or 2 lb. (1 qt.)/100 gal. water/400 sq. ft. used as drench.	Preplant.	This chemical is not a fumigant and therefore must be dispersed in soil by mechanical means or by water movement. When applied to established plants, residue should be washed off foliage as soon as possible.
AGAVE							See general statement.
AGERATUM	DBCP	Nonfood use		L or G	17-5 0.12 granules/ cu. yd. potting soil.	Preplant.	For soil treatment.

## FLOWER AND ORNAMENTAL CROPS

CROP	NEMATICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
AGLAONEMA	(See Chinese Evergreen)						
AJUGA	DBCP	Nonfood use					Treatment as for Achillea.
ALOE	DBCP	Nonfood use					Treatment as for Ageratum.
ANCHUSA	DBCP	Nonfood use					Treatment as for Achillea.
ARALIA	DBCP V-C 1-13	Nonfood use Nonfood use					Treatment as for Ageratum. Treatment as for African violet.
ARBORVITAE							See general statement.



FLOWER AND ORNAMENTAL CROPS

CROP	NEMATICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
ARDISIA	DBCP V-C 1-13	Nonfood use Nonfood use					Treatment as for Achillea.  Treatment as for African violet.
ARTEMISIA	DBCP	Nonfood use		L	18-26  8-17	Preplant, at planting time overall.  Postplant in row.	Wait 7 days before plant- ing for shallow-rooted plants; 4-6 months for deep-rooted plants.
ASPARAGUS FERN	DBCP V-C 1-13	Nonfood use Nonfood use					Treatment as for Achillea.  Treatment as for African violet.
ASTER	DBCP	Nonfood use					Treatment as for Achillea.
ASTILBE	DBCP	Nonfood use					Treatment as for Achillea.

## FLOWER AND ORNAMENTAL CROPS

CROP	NEMATOCIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
AZALEA	Bay 25141	Nonfood use		L or G	0.9-1.8/1000 sq. ft.	Preplant for ground beds and bench.	Use water sufficient for even distribution. Wet 4-6 inches.
				L	0.9-1.8/1000 sq. ft.	Postplant for ground beds and bench.	Use lower dosage rate for seedlings.
				G	0.05 oz. of 10% active granules/ cu. ft. 0.5 tsp. of 63.5% EC in 2 gal. of water.	Preplant for potting soil. Postplant for potted plants.	Mix thoroughly with soil.  Use 1/2 pt. of diluted solution per 6-inch pot as a drench.
	DBCP  V-C 1-13	Nonfood use  Nonfood use			375-750 ppm.	Bare-root dip.	Immerse roots of bare- rooted plants up to and including crown of root system for 30 minutes. After exposure, shake excess solution from roots and plant in sterilized soil.  Treatment as for Achillea.  Treatment as for African violet.
BABY TEARS	DBCP	Nonfood use					Treatment as for Ageratum.
BARBERRY	DBCP	Nonfood use					Treatment as for Achillea.
BEGONIA	DBCP	Nonfood use					Treatment as for Ageratum.

FLOWER AND ORNAMENTAL CROPS

CROP	NEMATICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
BLEEDING HEART	DBCP	Nonfood use					Treatment as for Achillea.
BLUEBERRY SHRUB	DBCP	Nonfood use					Treatment as for Artemisia.
BOUGAINVILLEA							See general statement.
BOWSTRING HEMP	V-C 1-13	Nonfood use					Treatment as for African violet.
BOXWOOD	Bay 25141	Nonfood use					Treatment as for Azalea.
	DBCP	Nonfood use					Treatment as for Achillea.
	V-C 1-13	Nonfood use					Treatment as for African violet.
CACTUS	DBCP	Nonfood use					Treatment as for Ageratum.

FLOWER AND ORNAMENTAL CROPS

CROP	NEMATICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
CALADIUM	DBCP	Nonfood use		L	0.83/100 gal. water.	Immerse soil-free tubers for 60 minutes.	Treatment as for Ageratum.
	thionazin	Nonfood use					Allow tubers to dry before planting or shipping. For commercial use only.
	V-C 1-13	Nonfood use					Treatment as for African violet.
CALENDULA							See general statement.
CAMELLIA	Bay 25141	Nonfood use					Treatment as for Azalea.
	DBCP	Nonfood use					Treatment as for Achillea.
	V-C 1-13	Nonfood use					Treatment as for African violet.
CAMPANULA	DBCP	Nonfood use					Treatment as for Achillea.
CANDY TUFT	V-C 1-13	Nonfood use					Treatment as for African violet.
CANTANOHE	DBCP	Nonfood use					Treatment as for Achillea.

FLOWER AND ORNAMENTAL CROPS

CROP	NEMATICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
CARISSA							See general statement.
CARNATION	V-C 1-13	Nonfood use					Treatment as for African violet.
CARYOPTERIS	DBCP	Nonfood use					Treatment as for Achillea.
CHAMAEDOREA	Bay 25141	Nonfood use					Treatment as for Azalea.
CHERRY, FLOWERING	DBCP	Nonfood use					Treatment as for Artemisia.
CHINESE EVERGREEN	Bay 25141 DBCP	Nonfood use Nonfood use					Treatment as for Azalea. Treatment as for Achillea.
CHINESE HOLLY	V-C 1-13	Nonfood use					Treatment as for African violet.

FLOWER AND ORNAMENTAL CROPS

CROP	NEMATICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
CHOKEBERRY	DBCP	Nonfood use					Treatment as for Artemisia.
CHRYSANTHEMUM	demeton          V-C 1-13	Nonfood use		L	0.25-0.5/50 gal. of water.   0.25 pt. of the 0.25 /50 gal. dilution/6-in. pot.  0.25 pt. of the 0.5/50 gal. dilution/6-in. pot.	Foliar spray or soil drench. Apply as spray and thoroughly wet foliage. Apply as soil drench 1 pt. of diluted solution/sq. ft. of bed or bench.  Postplant for potted plants. Apply at 7-14 day intervals for as many as three applications.  Postplant for potted plants. Apply at 14-21 day intervals for as many as three applications.	This chemical is systemic. It penetrates by absorption and is translocated in the plant. Do not apply within 5 days of hand picking, pruning, transplanting, or other handling. For control of foliar nema- todes. Not for home garden use.  Treatment as for African violet.
CODIAEUM							See general statement.
COLEUS	V-C 1-13	Nonfood use					Treatment as for African violet.

FLOWER AND ORNAMENTAL CROPS

CROP	NEMATICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
COREOPSIS							See general statement.
COSMOS	V-C 1-13	Nonfood use					Treatment as for African violet.
CROTON							See general statement.
CYCLAMEN	V-C 1-13	Nonfood use					Treatment as for African violet.
CYPRESS	Bay 25141	Nonfood use					Treatment as for Azalea.
DAFFODIL	demeton	Nonfood use					Treatment as for Chrysanthemum.
DAHLIA	V-C 1-13	Nonfood use					Treatment as for African violet.
DELPHINIUM	DBCP	Nonfood use					Treatment as for Achillea.

FLOWER AND ORNAMENTAL CROPS

CROP	NEMATICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
DENTZIA	DBCP	Nonfood use					Treatment as for Artemisia.
DIANTHUS	DBCP	Nonfood use					Treatment as for Achillea.
DIEFFENBACHIA	DBCP	Nonfood use					Treatment as for African violet.
DOGWOOD	DBCP	Nonfood use					Treatment as for Artemisia.
DRACAENA	DBCP	Nonfood use					Treatment as for Ageratum.
ECHINOPS	DBCP	Nonfood use					Treatment as for Artemisia.
EUONYMUS	Bay 25141 DBCP	Nonfood use Nonfood use					Treatment as for Azalea. Treatment as for Achillea.



## FLOWER AND ORNAMENTAL CROPS

CROP	NEMATICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
FATSIA	DBCP	Nonfood use					Treatment as for Achillea.
FELJOA	V-C 1-13	Nonfood use					Treatment as for African violet.
FICUS							See general statement.
FIRETHORN	(See Pyracantha)						
FORSYTHIA	DBCP	Nonfood use					Treatment as for Achillea.
FUNKIA	DBCP	Nonfood use					Treatment as for Achillea.
GALLBERRY	Bay 25141	Nonfood use					Treatment as for Azalea.

FLOWER AND ORNAMENTAL CROPS

CROP	NEMATOCIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
GARDENIA	Bay 25141 DBCP V-C 1-13	Nonfood use Nonfood use Nonfood use					Treatment as for Azalea. Treatment as for Achillea. Treatment as for African violet.
GERANIUM	V-C 1-13	Nonfood use					Treatment as for African violet.
GEUM	DBCP	Nonfood use					Treatment as for Artemisia.
GLADIOLUS	DBCP V-C 1-13	Nonfood use Nonfood use					Treatment as for Artemisia. Treatment as for African violet.
GLOXINIA							See general statement.
GODSEFFIANA	DBCP	Nonfood use					Treatment as for Ageratum.

## FLOWER AND ORNAMENTAL CROPS

CROP	NEMATICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
GYPSOPHILA	DBCP	Nonfood use					Treatment as for Achillea.
HAWORTHIA	DBCP	Nonfood use					Treatment as for Ageratum.
HELIOPSIS	DBCP	Nonfood use					Treatment as for Achillea.
HELLEBORUS	DBCP	Nonfood use					Treatment as for Achillea.
HIBISCUS	DBCP	Nonfood use					Treatment as for Achillea.
HOLLY	Bay 25141 DBCP	Nonfood use Nonfood use					Treatment as for Azalea. Treatment as for Achillea.
HOLLYHOCK							See general statement.
HONEYSUCKLE	Bay 25141	Nonfood use					Treatment as for Azalea.

FLOWER AND ORNAMENTAL CROPS

CROP	NEMATOCIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
HYACINTH							See general statement.
HYDRANGEA	DBCP	Nonfood use					Treatment as for Artemisia.
HYPERICUM	DBCP	Nonfood use					Treatment as for Achillea.
ILEX	DBCP	Nonfood use					Treatment as for Achillea.
IRIS	V-C 1-13	Nonfood use					Treatment as for African violet.
IVY (BOSTON AND ENGLISH)	DBCP	Nonfood use					Treatment as for Ageratum.
IXORA	V-C 1-13	Nonfood use					Treatment as for African violet.
JADE PLANT	DBCP	Nonfood use					Treatment as for Ageratum.

FLOWER AND ORNAMENTAL CROPS

CROP	NEMATICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
JAPANESE HOLLY	V-C 1-13	Nonfood use					Treatment as for African violet.
LARKSPUR	V-C 1-13	Nonfood use					Treatment as for African violet.
LAUREL	Bay 25141	Nonfood use					Treatment as for Azalea.
LAVENDER	DBCP	Nonfood use					Treatment as for Achillea.
LEATHERLEAF FERN							See general statement.
LEUCADENDRON	DBCP	Nonfood use					Treatment as for Ageratum.
LIGUSTRUM	DBCP	Nonfood use					Treatment as for Achillea.
LILAC							See general statement.

**FLOWER AND ORNAMENTAL CROPS**

CROP	NEMATICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
LILY	aldicarb	Nonfood use		G	5.0-7.0 (6.4 to 9.6 ounces of 10 G /1000 linear ft. of row), based on 40-inch row spacing.	At planting time in furrow with bulblets.	Cover with soil. Do not use plant parts for food or feed. For commercial production only. Do not plant other crops in treated soil within 100 days of last application.
	demeton	Nonfood use					Treatment as for Chrysanthemum. Croft lily shows toxicity.
	phorate	Nonfood use		G	10-16	At planting time: 1/2 dose applied under or on the lily bulb, 1/2 dose on soil on top of lily bulb. Apply as evenly as possible.	Restricted use. This chemical is systemic. For control of root lesion nematodes in Pacific Northwest only. For use by professional nurserymen and florists <u>only</u> in the production of commercially grown bulbs. Not for home garden use. For Easter lily only.
	V-C 1-13	Nonfood use					Treatment as for African violet.
LILY-OF-THE-VALLEY	DBCP	Nonfood use					Treatment as for Achillea
LYTHRUM	DBCP	Nonfood use					Treatment as for Achillea
MAGNOLIA	DBCP	Nonfood use					Treatment as for Artemisia.

FLOWER AND ORNAMENTAL CROPS

CROP	NEMATICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
MARANTA	Bay 25141	Nonfood use					Treatment as for Azalea.
	DBCP	Nonfood use					Treatment as for Achillea.
MARIGOLD	V-C 1-13	Nonfood use					Treatment as for African violet.
MONARDA	DBCP	Nonfood use					Treatment as for Achillea.
MONSTERA	DBCP	Nonfood use					Treatment as for Achillea.
NARCISSUS	V-C 1-13	Nonfood use					Treatment as for African violet.
NASTURTIUM	V-C 1-13	Nonfood use					Treatment as for African violet.
NAUTILICALYX	DBCP	Nonfood use					Treatment as for Ageratum.

FLOWER AND ORNAMENTAL CROPS

CROP	NEMATICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
NEANTHEBELLE PALM	Bay 25141 DBCP	Nonfood use Nonfood use					Treatment as for Azalea. Treatment as for Ageratum.
NEPHTHYTIS	DBCP	Nonfood use		L or G	17-52 or 0.12 granules/cu. yd. of potting soil.	Preplant, at planting time, postplant overall for plants established in soil.  Postplant, potted plants.	Wait 7-14 days before planting for shallow- rooted plants, 4-6 months for deep-rooted plants.
OLEANDER							See general statement.
OLIVE, RUSSIAN	Bay 25141	Nonfood use					Treatment as for Azalea.
OSMANTHUS	V-C 1-13	Nonfood use					Treatment as for African violet.
PACHYSANDRA	DBCP	Nonfood use					Treatment as for Achillea.
PANDA EARS	DBCP	Nonfood use					Treatment as for Ageratum.



FLOWER AND ORNAMENTAL CROPS

CROP	NEMATICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
PANSY	DBCP V-C 1-13	Nonfood use Nonfood use					Treatment as for Achillea. Treatment as for African violet.
PARLOR PALM	Bay 25141 V-C 1-13	Nonfood use Nonfood use					Treatment as for Azalea. Treatment as for African violet.
PENSTEMON	DBCP	Nonfood use					Treatment as for Achillea.
PEONY	DBCP V-C 1-13	Nonfood use Nonfood use					Treatment as for Achillea. Treatment as for African violet.
PEPEROMIA	Bay 25141 DBCP	Nonfood use Nonfood use					Treatment as for Azalea. Treatment as for Achillea.
PERIWINKLE	DBCP V-C 1-13	Nonfood use Nonfood use					Treatment as for Achillea. Treatment as for African violet.

FLOWER AND ORNAMENTAL CROPS

CROP	NEMATOCIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
PHILADELPHUS	DBCP	Nonfood use					Treatment as for Artemisia.
PHILODENDRON	Bay 25141	Nonfood use					Treatment as for Azalea.
	DBCP	Nonfood use					Treatment as for Achillea.
PHLOX	DBCP	Nonfood use					Treatment as for Achillea.
PHOTINIA	Bay 25141	Nonfood use					Treatment as for Azalea.
	V-C 1-13	Nonfood use					Treatment as for African violet.
PIERIS							See general statement.
PINKS							See general statement.
PITTOSPORUM	DBCP	Nonfood use					Treatment as for Achillea.

FLOWER AND ORNAMENTAL CROPS

CROP	NEMATICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
PLUM (JAPANESE)	Bay 25141	Nonfood use					Treatment as for Azalea.
PODOCARPUS	V-C 1-13	Nonfood use					Treatment as for African violet.
POINSETTIA	V-C 1-13	Nonfood use					Treatment as for African violet.
POLYGONUM DISTORTUM	DBCP	Nonfood use					Treatment as for Artemisia.
POPPY	DBCP	Nonfood use					Treatment as for Achillea.
POTHOS	V-C 1-13	Nonfood use					Treatment as for African violet.
PRICKLY PEAR	V-C 1-13	Nonfood use					Treatment as for African violet.

FLOWER AND ORNAMENTAL CROPS

CROP	NEMATICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
PRIMROSE	demeton	Nonfood use					Treatment as for Chrysanthemum.
PRINCESS FLOWER	V-C 1-13	Nonfood use					Treatment as for African violet.
PRIVET	Bay 25141	Nonfood use					Treatment as for Azalea.
	DBCP	Nonfood use					Treatment as for Achillea.
	V-C 1-13	Nonfood use					Treatment as for African violet.
PYRACANTHA	Bay 25141	Nonfood use					Treatment as for Azalea.
	V-C 1-13	Nonfood use					Treatment as for African violet.
PYRETHRUM	DBCP	Nonfood use					Treatment as for Artemisia.
QUINCE, FLOWERING	DBCP	Nonfood use					Treatment as for Achillea.
RHODODENDRON							See general statement.

## FLOWER AND ORNAMENTAL CROPS

CROP	NEMATICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
ROSE	DBCP	Nonfood use		L	8.6-86	Preplant, postplant: overall or in row.	8.6 lb./acre dosage in row application for plants newly set up to 6 months of age; 17 lb. /acre for established plants 6-12 months old; 43 lb./acre for established plants over 12 months old; 43-86 lb. /acre as preplant treat- ment at least 7-14 days before planting.
	V-C 1-13	Nonfood use					Treatment as for African violet.
ROSE MALLOW	V-C 1-13	Nonfood use					Treatment as for African violet.
RUDBECKIA	DBCP	Nonfood use					Treatment as for Achillea.
SALVIA	DBCP	Nonfood use					Treatment as for Achillea.
SANSEVIERIA	Bay 25141	Nonfood use					Treatment as for Azalea.

FLOWER AND ORNAMENTAL CROPS

CROP	NEMATICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
SARCOCCA	DBCP	Nonfood use					Treatment as for Ageratum.
SCHEFFLERA	DBCP	Nonfood use					Treatment as for African violet.
SCINDAPSUS	Bay 25141	Nonfood use					Treatment as for Azalea.
SEDUM	DBCP	Nonfood use					Treatment as for Achillea.
SNAPDRAGON	V-C 1-13	Nonfood use					Treatment as for African violet.
SNOWBERRY	DBCP	Nonfood use					Treatment as for Artemisia.
SPATHYPHYLLUM	DBCP	Nonfood use					Treatment as for Ageratum.

FLOWER AND ORNAMENTAL CROPS

CROP	NEMATICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
SPIREA	DBCP	Nonfood use					Treatment as for Artemisia.
STOCK							See general statement.
STOKESIA	DBCP	Nonfood use					Treatment as for Achillea.
SWEET PEA	V-C 1-13	Nonfood use					Treatment as for African violet.
TAXUS	Bay 25141	Nonfood use					Treatment as for Azalea.
TRADESCANTIA	DBCP	Nonfood use					Treatment as for Ageratum.
TRITONIA	DBCP	Nonfood use					Treatment as for Achillea.
TROLLIUS	DBCP						Treatment as for Achillea.

## FLOWER AND ORNAMENTAL CROPS

CROP	NEMATICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
TULIP	V-C 1-13	Nonfood use					Treatment as for African violet.
VERONICA	DBCP	Nonfood use					Treatment as for Achillea.
VIBURNUM	DBCP	Nonfood use					Treatment as for Artemisia.
VIOLA	DBCP	Nonfood use					Treatment as for Achillea.
WEIGELA	DBCP	Nonfood use					Treatment as for Achillea.
YEW	(See Taxus)						
ZINNIA							See general statement.



# FRUIT AND NUT CROPS

CROP	NEMATICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
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## GENERAL FRUIT AND NUT CROP USES

Some chemicals, listed first in this section of the table, can be considered for their use as nematicides for preplant treatments in soil in which fruit and nut crops are to be grown. General conditions of use of these nematicides are similar for all these crops, and the nematicides do not require tolerances. Other chemicals, listed under the various fruit and nut crops, can also be considered for use as nematicides, but these require more specific conditions of use or tolerances, or both. Consult local production specialists before proceeding with treatments.

	carbon disulfide	Nonfood use		L	3000-5000	Overall preplant for fields, tree sites, and nurseries.	Close injection sites or use tarp to seal in fumigant. Leave soil undisturbed for 7 days. Do not plant within 21 days of treatment.
	chloropicrin	Nonfood use		L	480-635	Overall preplant for fields, tree sites, and nurseries.	Exposure period 24-48 hours. Aerate 7-14 days before planting. Max. 1076 lb./acre.
	DD	Nonfood use		L	0.5-1.5 cu. yd. 250-600 Up to 1700 for deep penetration of planting sites.	Preplant for bulk soil. Overall preplant for fields, tree sites, and nurseries.	Wait 7 days before planting for each 100 lb. applied, longer in case of heavy rains or temperatures below 60° F. 2000 lb./acre is allowed for citrus only; wait 3-6 months before planting. See exceptions for Pineapple and Strawberry.

FRUIT AND NUT CROPS

CROP	NEMATICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
	DD-MENCS	Nonfood use		L	145-240	Overall preplant for fields, tree sites, and nurseries.	Exposure period 4-7 days when soil temperature is 60° F. or higher and 7-21 days when soil temperature is lower.
					576-672	Overall preplant for citrus and orchard tree sites.	Tarp or water seal may be used; after exposure period aerate by cultivation or disking.
					480	Overall preplant for grape.	Aerate 7 days for each 12 gal. (115 lb.) used.
	1,3-D	Nonfood use		L	202-1375	Overall preplant for fields, tree sites, and nurseries.	Wait 7 days before planting for each 100 lb. applied, longer in case of heavy rains or temperatures below 60° F.
					480	Overall preplant for grape.	1920 lb./acre is allowed for citrus only; wait 3-6 months before planting. See exceptions for Pineapple and Strawberry.
	EDB	Nonfood use		L	180	Overall preplant for fruit tree planting sites and nurseries.	Wait 7-14 days or longer exposure period and 3-6 months for aeration of planting sites before planting. See exception for Strawberry.
	MBR	Nonfood use		L (Usually 98% MBR in combination with 2% chloro-picrin)	412	Preplant for fruit tree sites:	Use with plastic tarp, which should remain in place for 48 hours when soil temperature is 60° F. or higher and 3-4 days when soil temperature is lower. Do not plant for 7-10 days after tarp is removed.

**FRUIT AND NUT CROPS**

CROP	NEMATICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
	SMDC	Nonfood use		L       END OF GENERAL STATEMENT	124-338 0.388 (1 pt.)- 0.775 ( 1 qt.)/ 50-100 sq. ft. 1/2 oz./cu. ft.	Overall preplant for fields, tree sites, and nurseries.	For soil injection, sprinkler, flood irri- gation, and rotary tiller application. A water seal can be used. After an exposure of 5-7 days, aerate by cultivation. Wait an additional 7-14 days before planting.
ALMOND							See general statement.
APPLE	thionazin	Nonfood use		L	1/100 gal. water (1200 ppm active ingredient).	At planting time as bare-root dip.	Bare-root dip for dormant nursery stock only. Immerse roots only for 15 minutes. For commercial use only.
APRICOT	DBCP	5		L	36-84	Overall preplant, at planting time, postplant.	At highest preplant dosage, wait 4-6 weeks before planting. Use only on mineral soils.
	thionazin	Nonfood use			35	Overall at planting time, postplant.	Use only on mineral soils. Treatment as for Apple.
AVOCADO							See general statement.

**FRUIT AND NUT CROPS**

CROP	NEMATICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
BANANA	DBCP	125  75 in pulp		L	17-86	Overall preplant, at planting time, postplant in rows.	Re-treat 17 lb./acre not more often than once each 9-12 month period after first application. Use on mineral soils only.
	V-C 9-104	0.02		G	17-54  6 gms. in radius of 0.75 meter (=to 0.2 ounces in radius of 30 inches) around stem.	Postplant in rows.  Postplant	Apply granules evenly around stem after clearing litter from area. If soil is dry, mix granules into top inch. Repeat treatment in 6 months. Limit is 6 gms. active per stem.
BLACKBERRY	DBCP	25	48	L	26-86	Overall preplant, at planting time, postplant.	Wait 7-14 days before planting. Do not re-treat more than once in each 9-12 month period after first application.
BLUEBERRY							See general statement.
BOYSENBERRY	DBCP	25	48				Treatment as for Blackberry.
CHERRY	thionazin	Nonfood use					Treatment as for Apple.

**FRUIT AND NUT CROPS**

CROP	NEMATICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
CITRUS	Bay 25141	Nonfood use		L	860 ppm active ingredient.	At planting time as bare-root dip.	Bare-root dip for nursery stock for 30 minutes. For commercial growers and applications only, for citrus seedlings-nonbearing citrus.
					200 mg./8-in. pot.	Postplant for potted plants.	Do not apply to dry pots or if plants are wilted. For commercial use only, for citrus seedlings-nonbearing citrus.
	DBCP	20		L	48-109	Overall preplant, at planting time, postplant for fields and tree sites.	Do not apply more often than once in 3 years. Preplanting, chisel or irrigation application; postplanting, irrigation preferred.
	thionazin	Nonfood use		L	0.33 actual/100 gal. of water (400 ppm active ingredient).	Postplant drench for potted plants.	Potted plant drench for rough lemon or sour orange rootstocks. Soil must be moist before treatment. Apply emulsion to saturated soil. For commercial use only.
					0.83 actual/100 gal. of water (1000 ppm active ingredient).	At planting time as bare-root dip.	Bare-root dip for rough lemon or sour orange rootstocks. Immerse roots only for 60 minutes. For commercial use only.
CURRENT							See general statement.

**FRUIT AND NUT CROPS**

CROP	NEMATICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
DEWBERRY	DBCP	25	48				Treatment as for Blackberry.
FIG	DBCP	75	365	L	43-61	Overall preplant, at planting time, postplant.	Wait 4-6 weeks before planting. Use only on mineral soils.
GOOSEBERRY							See general statement.
GRAPE	DBCP	25					Treatment as for Apricot.
LOGANBERRY	DBCP	25					Treatment as for Blackberry.
NECTARINE	DBCP	5					Treatment as for Apricot.
PEACH	DBCP thionazin	5 Nonfood use					Treatment as for Apricot. Treatment as for Apple.
PEAR	thionazin	Nonfood use					Treatment as for Apple.

FRUIT AND NUT CROPS

CROP	NEMATOCIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
PECAN							See general statement.
PINEAPPLE	DBCP	50	270	L	34-138	Overall preplant, at planting time, postplant.	At highest dosage, wait 7-14 days before planting. Maximum 138 lb./year.
	DD and 1,3-D	Nonfood use		L	300-600	Overall just before planting.	Limit 600 lb./acre. Allow at least 2 days between treatment and planting at high dosage rates. In Hawaii, the application can be made either just before plant- ing or at time of plant- ing.
	MBR	25		L (98% + 2% chloropicrin)	Up to 872	Overall preplant for seedbed and plant beds.	Expose to fumigation under plastic tarp for at least 24 hours (up to 48 hours). Aerate for at least 3 days before seed- ing or 5-14 days before setting vegetative growth
	V-C 9-104	0.02 in fruit, fodder, and forage.		G	20-40	Preplant overall or at planting time.	Preplant may be up to 21 days before planting. Mix into top 4 inches of soil. Limit is 40.0 lbs./ acre.
PLUM AND PRUNE	thionazin	Nonfood use					Treatment as for Apple.
QUINCE							See general statement.

**FRUIT AND NUT CROPS**

CROP	NEMATICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
RASPBERRY	DBCP	25					Treatment as for Blackberry.
STRAWBERRY	DD and 1,3-D	Nonfood use		L	320-600	Overall preplant.	Wait at least 14-21 days before planting.
	DBCP	10	55	L or G	26	Overall preplant.	Use on mineral soils only.
					8-26	Preplant or postplant in row.	Do not exceed maximum dosage per acre in a single year.
	EDB	5		L	108	Overall preplant.	Wait 7-21 days before planting.
	MBR	30					Treatment as for Pineapple.
	thionazin	Nonfood use					Treatment as for Apple.
WALNUT, ENGLISH	DBCP	10	100	L	34-86	Overall preplant, at planting time, postplant.	At preplant dosage, allow 4-6 weeks between treatment and planting.



## GRASS AND TURF CROPS

CROP	NEMATICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
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## GENERAL GRASS AND TURF USES

Some chemicals can be considered for their use as nematicides for preplant treatments in soil in which grass and turf are to be grown, or for postplant treatments on established grass and turf. General conditions of use of these nematicides are similar for all these crops, and the nematicides do not require tolerances. Specific conditions of use or tolerances, or both, should be checked with local specialists before treatments are applied.

	Bay 25141	Nonfood use	30	L or G	11-22	Preplant, postplant overall.	For use in Florida only on bahiagrass, bermudagrass, centipedegrass, St. Augustinegrass, and zoysia grass. Do not treat newly seeded areas. Do not cut or handle sod for 30 days after treatment. Do not use in or near human dwellings. This material kills by contact; therefore, mix it with soil to obtain maximum control. Preplant and postplant use: apply 1/4-1/2 inch of water to drench in thoroughly after treatment. Not for home lawns and school yards.
	chloropicrin	Nonfood use		L	480-635  0.5-1.5/cu. yd.	Preplant overall for field.  Preplant for bulk soils.	Exposure period 24-48 hours.  Aerate 7-14 days before planting. Max. 1076 lb./acre.

## GRASS AND TURF CROPS

CROP	NEMATOCIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
	diazinon	Nonfood use		L	40-54	Postplant overall.	For use on turf and lawns for the control of sting nematodes, lance nematodes, ring nematodes, spiral nematodes, stylet nematodes, sheathoid nematodes, and pin nematodes. Do not graze livestock in treated areas. Keep children and pets off grass until spray is completely dry. Apply evenly over surface. Water in with 1/2-1 acre-inch of water immediately afterward.
	DBCP	Nonfood use		L	43-86	Preplant, postplant overall.	If preplant, wait 7-14 days before seeding. For bentgrasses, bluegrasses, bermudagrass, and St. Augustinegrass. Do not exceed 70 lb./acre postplant on bentgrasses. After application, apply 100 gal./1000 sq. ft., or 1/2-1 acre-inch of irrigation water, or enough to wet at least 6 inches deep.
	DD	Nonfood use		L	200-600	Preplant overall.	Overall treatment is 150-200 lb./acre on mineral soil (300 lb./acre for cyst nematodes), 400-600 lb./acre on peat or muck. Wait 7 days before planting for each 100 lb. applied, longer in case of heavy rains or temperatures below 60° F.

**GRASS AND TURF CROPS**

CROP	NEMATOCIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
	DD-MENCS	Nonfood use		L	145-240	Preplant overall.	After application, drag and firm soil. Keep undisturbed 4-7 days when soil temperatures are 60° F. or higher and 7-21 days when temperatures are lower. Tarp may be used. After exposure period, aerate by cultivating or disking. Aerate 7 days for each 12 gal. (115 lb.).
	1,3-D	Nonfood use		L	160-486	Preplant overall.	Overall treatment is 150-200 lb./acre on mineral soil (300 lb./acre for cyst nematodes), 400-600 lb./acre on peat or muck. Wait 7 days before planting for each 100 lb. applied, longer in case of heavy rains or temperatures below 60° F.
	MBR	Nonfood use		100% L or 98% L in combination with 2% chloropicrin.	1-2 lb./100 sq. ft.	Preplant overall.	Expose 24-48 hours under gas-proof tarp. Aerate for at least 2 days before seeding or 6-10 days before setting plants.
	SMDC	Nonfood use		L	233-338	Preplant overall.	For lawn seedbeds, sprinkling can, hose proportioner, and soil injection.

## GRASS AND TURF CROPS

CROP	NEMATICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
	V-C 1-13	Nonfood use		L or G	1 lb. (equal to 1 pt.) of 75% in 10 gal. of water/375 sq. ft.	Apply to established turf with sufficient water to penetrate at least 3 inches into soil. For seedbeds, same dosage, tilled 6 inches deep after application. Wait 14 days before seeding.	This chemical is not a fumigant; therefore, it must be dispersed in soil by water movement or by mechanical means. On established grasses, apply as a drench or spray and then water thoroughly. For bent-grasses, apply 1/2 of the cited rate, then repeat after 14 days. Always wash chemical from grass blades.
	V-C 9-104	Nonfood use	21	G	20-30	Overall treatment for established turf. Follow with 1/2 inch of water.	For control of sting nematodes and other plant parasitic nematodes on commercial turf such as bahiagrass, bermudagrass, centipedegrass, St. Augustinegrass, and zoysia grass. Do not use on newly seeded areas until grass is well established. Do not cut or handle sod or turf for 21 days after treatment. Not for home lawns or school yards.

## OILSEED AND INDUSTRIAL CROPS

CROP	NEMATICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
HOPS	DD	Nonfood use		L	200-600 72-200	Preplant overall. Preplant in row.	Limit 600 lb./acre. Wait 7 days before planting for each 100 lb. applied, longer in case of heavy rains or temperatures below 60° F.
	DD-MENCs	Nonfood use		L	145-240	Preplant overall.	Exposure period 4-7 days when soil temperature is 60° F. or higher and 7-21 days when soil temperature is lower. Tarp can be used. After exposure period, aerate by cultivation or disking. Aerate 7 days for each 12 gal. (115 lb.) used.
	1,3-D	Nonfood use		L	160-480 60-160	Preplant overall. Preplant in row.	Allow at least 10-14 days between treatment and planting, longer in case of heavy rains or temperatures below 60° F.
MINT							Treatment as for Hops.
PEANUT	Bay 25141	0.05 nuts 5.0 hulls		G	4 (36-inch rows) or 4.4 ounces/1000 linear ft. of row.	Preplant in rows.	Apply as 12-18 inch bands in rows followed by incorporation to 4-6 inch depth. Do not place treated zones closer together than 6 inches. Do not apply more than 7.0 lb. active/acre in any crop year and area where subsequent treatments for insect control are made. Use restricted to Southeastern States.

Continued

## OILSEED AND INDUSTRIAL CROPS

CROP	NEMATOCIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS~
PEANUT  (Con.)	DBCP	50	2-3 years. See re- strictions at right.	L	17-26  8.6/12,400 linear ft. of row.	Preplant, at planting time overall.  Preplant, at planting time in row.	Waiting period before planting not required. Hay and hulls from treated fields are not suitable as feed for meat or lactating dairy ani- mals. Do not sell or otherwise introduce into commerce. Any forage crop grown on treated soil should not be used as feed for dairy animals or animals being finished for slaughter until 2 years after row treat- ment or 3 years after overall treatment.
	DD	Nonfood use		L	150-250 75-200	Preplant overall. Preplant in row.	Wait 10-14 days before planting, longer in case of heavy rains or temper- atures below 60° F.
	DD-MENCS	Nonfood use		L	145-240  48-72	Preplant overall.  Preplant in row.	Exposure period 4-7 days, with or without tarp; after exposure period aerate by cultivation, then wait 10-21 days before planting.  Apply 8-12 inches deep in furrow; cover with listed bed of soil; wait 14-21 days before planting, longer in case of heavy rains or temperatures below 60° F.
	1,3-D	Nonfood use		L	120-200 60-80	Preplant overall. Preplant in row.	Allow at least 10-14 days between treatment and planting, longer in case of heavy rains or temper- atures below 60° F.

Continued

## OILSEED AND INDUSTRIAL CROPS

CROP	NEMATICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
PEANUT (Con.)	EDB	25		L	56 36	Preplant overall. Preplant in row.	See restriction statement for DBCP. Wait at least 14-21 days before plant- ing. (Not for control of cyst nematodes.)
	V-C 9-104	0.02 nuts		G	3-4 (42-inch rows) or 0.025 to 0.033/ 100 linear ft. of row.	Preplant or at planting time in row.	Row treatments at one week before, up to treat- ments at planting time. Apply as 15-18 inch bands, then incorporate in soil to depths of 4-8 inches. Limit is 4.0 lb. active/12,400 linear ft.
SOYBEAN	DD	Nonfood use		L	150-250 75-200	Preplant overall. Preplant in row.	Wait 10-14 days before planting, longer in case of heavy rains or temper- atures below 60° F.
	V-C 9-104	0.02 for beans, forage, and hay		G	1.5-3.0 (42-inch rows) or 0.0125 to 0.0250/100 linear ft. of row.	Row treatment from one week before planting, up to time of planting.	Apply as 12-15 inch band and mix into soil to depth of 3-6 inches. Limit is 3.0 lb. active/ acre on 42-inch rows.

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Use Pesticides Safely—Follow the Label

**TREE CROPS**

CROP	NEMATICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
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**GENERAL TREE CROP USES**

Some chemicals, listed first in this section of the table, can be considered for their use as nematicides for preplant treatments in soil in which tree crops are to be grown. General conditions of use of these nematicides are similar for all these crops, and the nematicides do not require tolerances. Other chemicals, listed under the various grass and turf crops, can also be considered for use as nematicides, but these require more specific conditions of use or tolerances, or both. Economic considerations may limit the use of several of these treatments to ornamental trees. Consult local production specialists before proceeding with treatments.

	DD	Nonfood use		L	250-1700	Preplant for planting sites in nurseries and fields.	Allow 2-6 months or longer before planting.
	DD-MENCS	Nonfood use		L	145-240	Preplant for planting sites and seedbeds.	Expose to fumigant for 4 days. Aerate 7 days for each 12 gal. (115 lb.) used.
	1,3-D	Nonfood use		L	202-1375	Preplant for planting sites.	Allow 14-21 days in lower dose range and 2-3 months in higher dose range before planting.
	EDB	Nonfood use		L	72-180	Preplant overall for planting sites and seedbed.	Allow 7-14 days or longer for exposure period and aerate 3-6 months before planting.
				L in combination with dichloropropenes.	53 EDB in combination with 195 dichloropropenes.	Preplant overall.	Allow 14-21 days before planting, longer in case of heavy rains or temperatures below 60° F.



CROP	NEMATICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
	MBR	Nonfood use		100% L or 98% L in combination with 2% chloro- picrin.	1-2 lb./100 sq. ft; 412/acre.	Preplant overall for nurseries, fruit tree planting sites, and seed- beds.	For deep-rooted crops and for propagating beds, expose for 48 hours under gas-proof tarp. Aerate 14 days before planting. 30-40% less chemical required if chisel in- jected. Mycorrhiza may be affected in some soils. If in doubt, consult local production special- ists before use.
	SMDc	Nonfood use		L	0.775/100 sq. ft.	Preplant overall.	Make shallow basin over planting site. Add chemical to stream of water, filling basin. Apply 1 to several acre- inches of water to aid vertical distribution in soil, to depth of 6 feet in some soils.
END OF GENERAL STATEMENT							
ASH, MOUNTAIN	DBCP	Nonfood use		L	34-86	Preplant overall, post- plant.	On preplant treatment, wait 4-6 months before planting.
BUTTERNUT							See general statement.

TREE CROPS

CROP	NEMATICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
CEDAR, PORT ORFORD	DD	Nonfood use		L	200-700	Preplanting fumigation by injection.	Allow 2-6 months or longer before planting.
CRABAPPLE, FLOWERING							See general statement.
ELM, AMERICAN	DBCP	Nonfood use					Treatment as for Ash, Mountain.
FIR: DOUGLAS, RED, AND WHITE	DD	Nonfood use					Treatment as for Cedar, Port Orford.
FIR: OTHER							See general statement.
HAWTHORN							See general statement.
HEMLOCK, WESTERN, AND OTHER	DD	Nonfood use					Treatment as for Cedar, Port Orford.
HICKORY							See general statement.
HORSECHESTNUT							See general statement.

**TREE CROPS**

CROP	NEMATICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
JUNIPER	Bay 25141	Nonfood use		L or G	0.9-1.8/1000 sq. ft.  375-750 ppm  0.5 tsp. of 63.5% L/2 gal. of water.  0.05 oz. granular/ cu. ft.	Postplant overall for beds and benches.  Bare-root dip for 30 minutes.  Postplant, potted plants.  Preplant, potting soil.	Use water sufficient for even distribution: wet to 4-6 inches. Use lower dosage rate for seed- lings.  Do not dilute dip solution or rinse off after treatment.  Apply 0.5 pt. diluted solution per 6-inch pot.  Mix thoroughly with soil.
LOCUST	DBCP	Nonfood use					Treatment as for Ash, Mountain.
MAGNOLIA	Bay 25141 DBCP	Nonfood use Nonfood use		L	8-26	Preplant overall, post- plant.	Treatment as for Juniper.  On preplant treatment, wait 4-6 months before planting.
MAPLE	DBCP	Nonfood use					Treatment as for Ash, Mountain.
OAK	DBCP	Nonfood use					Treatment as for Ash, Mountain.

**TREE CROPS**

CROP	NEMATICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
PINE, PONDEROSA	DD	Nonfood use					Treatment as for Cedar, Port Orford.
PINE, SOUTHERN	DD	Nonfood use					Treatment as for Cedar, Port Orford.
	MBR-CP			98% L	300-400	Preplanting fumigation by injection under plastic covers.	
				70% L petro- leum solvent	250-300	Preplanting fumigation by injection under plastic covers.	
PINE: WHITE, JACK, RED, SCOTCH, AND SLASH	thionazin	Nonfood use		L or G	0.38-0.76/1000 sq. ft.	Postplant.	Sprinkle irrigate with 1 acre-inch of water immedi- ately after treatment. Do not disturb soil for 2 weeks after treatment. Repeat in 6 months if necessary. These treat- ments are for the contrd of root-knot nematodes, burrowing nematode, and root lesion nematodes. For white pine for ornamental purposes only.
POPLAR							See general statement.
RED BUD							See general statement.

**TREE CROPS**

CROP	NEMATICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
REDCEDAR, EASTERN	MBR-CP			98% L	854	Preplanting fumigation by injection under plastic covers.	For deep-rooted crops and for propagating beds. Expose for 48 hours under gas-proof tarp. Aerate 14 days before planting; 30-40% less chemical required if chisel injected.
REDCEDAR, WESTERN	DD	Nonfood use		70% L petro- leum solvent .	175	Preplanting fumigation by injection under plastic covers.	
							Treatment as for Cedar, Port Orford.
SPRUCE: NORWAY, SITKA, AND OTHERS	DD	Nonfood use					Treatment as for Cedar, Port Orford.
SYCAMORE							See general statement.
TAXUS							See general statement.
TULIP TREE							See general statement.

**VEGETABLE CROPS**

CROP	NEMATOCIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
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**GENERAL VEGETABLE CROP USES**

Some chemicals, listed first in this section of the table, can be considered for their use as nematocides for preplant treatments in soil in which vegetable crops are to be grown. General conditions of use of these nematocides are similar for all these crops, and the nematocides do not require tolerances. Other chemicals, listed under the various vegetable crops, can also be considered for use as nematocides, but these require more specific conditions of use or tolerances, or both. Consult local production specialists before proceeding with treatments.

	chloropicrin	Nonfood use		L	480-635	Preplant for seedbed soil.	Exposure period 24-48 hours.
					0.5-1.5/cu.yd.	Preplant for bulk treatment of rooting soil.	After exposure period, aerate 7-14 days before planting. Max. 1076 lb./acre. See exception for Celery in Florida.
	DD	Nonfood use		L	150-250	Preplant overall for mineral soils.	Limit 600 lb./acre. Wait 14-21 days before planting for mineral soils,
					400-600	Preplant overall for muck and peat soils.	21 days or more for muck and peat soils. These periods must be extended in case of heavy rains or temperatures below 60° F. (A minimum of 300 lb/acre on mineral soils for the control of cyst nematodes; for this treatment the waiting period before planting is 21-28 days.)
					75-100	Preplant in row for mineral soils.	
					150-200	Preplant in row for muck or peat soils.	

**VEGETABLE CROPS**

CROP	NEMATOCIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
	DD-MENCs	Nonfood use		L	145-240	Preplant overall.	Exposure period 4-7 days when soil temperature is 60° F. or higher and 7-21 days when soil temperatures are lower. Tarp can be used. After exposure period, aerate by cultivation or disking. Aerate 7 days for each 12 gal. (115 lb.) used.
					48-72	Preplant in row.	Apply 8-12 inches deep in furrow; cover with listed bed of soil; wait 14-21 days before planting, longer in case of heavy rains or temperatures below 60° F.
	1,3-D	Nonfood use		L	120-200	Preplant overall for mineral soils.	Allow at least 14-21 days between treatment and planting. (250 lb./acre on mineral soils for control of cyst nematodes.)
					320-480	Preplant overall for muck and peat soils.	
					60-80	Preplant in row for mineral soils.	
					120-160	Preplant in row for muck and peat soils.	
	SMDC	Nonfood use		L	233-338 (0.75-1 qt./100 sq. ft.)	Preplant overall for fields and seedbeds.	For soil injection or flood irrigation, plastic cover can be used; keep in place 24-48 hours. Wait at least 21 days before planting, 30 days at low temperature or at high rates of application.
END OF GENERAL STATEMENT							

**VEGETABLE CROPS**

CROP	NEMATICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
ASPARAGUS	EDB	10		L	54-108  24-36	Preplant overall.  Preplant in row.	Wait 7-21 days before planting.
BEAN, LIMA	EDB	5		L  In combination with dichloro- propenes	54-108  24-36  53 EDB in combi- nation with 195 dichloropropenes. Maximum on muck soils or 35 EDB + 130 dichloro- propenes on mineral soils.	Preplant overall.  Preplant in row.  Preplant overall.	Wait 7-21 days before planting.
BEAN, SNAP	DBCP	75		L or G	17-24  9-12/8400 linear ft. of row.	Preplant, at planting time overall.  Preplant, at planting time, postplant in row.	Do not feed plant remains to livestock.
BEET, TABLE							See general statement.



**VEGETABLE CROPS**

CROP	NEMATICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
BROCCOLI	DBCP	50					Treatment as for Bean, Snap.
	EDB	75					Treatment as for Bean, Lima.
	MBR	25	L	L (98% + 2% chloropicrin)	40 to 872	Preplant overall for seedbeds and plant beds.	Expose to fumigation under plastic tarp for at least 24 hours (up to 48 hours). Aerate for a minimum of 3 days before seeding or 5-14 days before setting vegetative growth.
BRUSSELS SPROUTS	DBCP	50					Treatment as for Bean, Snap.
CABBAGE	DBCP	50					Treatment as for Bean, Snap.
CANTALOUPE	DBCP	50		L or G	0.67-1/1000 linear ft. of row (any spacing).  26	Preplant, at planting time in row (based on 5-ft. row spacing).  Preplant overall.	Limit 26 lb./acre. Wait 7-14 days before planting. For use as granules in a fertilizer mixture, apply recommended dosage. Do not adjust application rates to meet specific fertilizer requirements.
	EDB	75		L	27-36	Preplant in row (based on 5-ft. row spacing).	Wait 10-14 days before planting, 1 week longer in cold wet weather.

**VEGETABLE CROPS**

CROP	NEMATICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
CARROT	DBCP	75					Treatment as for Bean, Snap.
	EDB	75					Treatment as for Bean, Lima.
CAULIFLOWER	DBCP	50					Treatment as for Bean, Snap.
	EDB	10					Treatment as for Bean, Lima.
	MBR	25					Treatment as for Broccoli.
CELERY	chloropicrin	Nonfood use		L	1,021	Preplant.	Seedbeds only. Florida only.
	DBCP	75		L	17-24  5.7-8/13,100 linear ft. of row.	Preplant, at planting time, overall.  Preplant, at planting time, postplant in row.	Field use.
COLLARDS							See general statement.
CORN, SWEET	(See Sweet Corn)						

**VEGETABLE CROPS**

CROP	NEMATICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
CUCUMBER	DBCP	25		L or G	17-26  9-13/7300 linear ft. of row.  6	Preplant overall and in row.  Preplant, at planting time, postplant in row.  At planting time in row, granules. (5-foot rows.)	Apply 4-10 inches deep.   Apply in fertilizer mixture 6 inches deep, 6 inches on either side of row. For use as granules, apply recommended dosage. Do not adjust application rates to meet specific fertilizer requirements.
	EDB	30					Treatment as for Bean, Lima.
EGGPLANT	DBCP	50		L	17-26  6-12/10,400 linear ft. of row.	Preplant, at planting time, postplant: overall  Preplant, at planting time, postplant in row.	Apply 4-10 inches deep. Limit 25 lb./acre overall.  Treatment as for Bean, Lima.
	EDB	50					Treatment as for Bean, Lima.
	MBR	60					Treatment as for Broccoli.
ENDIVE (ESCAROLE)	DBCP	130		L	17-24  12/21,800 linear ft. of row.	Preplant, at planting time, overall.  Preplant, at planting time, postplant in row.	

**VEGETABLE CROPS**

CROP	NEMATICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
<b>GARLIC</b>	<b>(See Onion and Garlic)</b>						
<b>HONEYDEW MELON</b>	<b>DBCP</b>	50					Treatment as for Cantaloup.
	<b>EDB</b>	75					Treatment as for Asparagus.
<b>KALE</b>							See general statement.
<b>KOHLRABI</b>							See general statement.
<b>LETTUCE</b>	<b>DBCP</b>	130					Treatment as for Endive.
	<b>EDB</b>	30					Treatment as for Bean, Lima.
<b>MUSKMELON (See Cantaloup)</b>	<b>MBR</b>	40					Treatment as for Broccoli.
<b>MUSTARD GREENS</b>							See general statement.

**VEGETABLE CROPS**

CROP	NEMATOCIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
OKRA	DBCP	75		L or G	17-24	Preplant overall.	Limit 24 lb./acre. Wait 7-14 days before planting
	EDB	50			9-13/8700 linear ft. of row.	Preplant, at planting time, postplant in row.	Treatment as for Bean, Lima.
ONION AND GARLIC							See general statement.
PARSNIP	DBCP	75		L	17-24	Preplant overall.	Do not feed to livestock.
	EDB	75			9-12/14,500 linear ft. of row.	Preplant, at planting time, postplant in row.	Treatment as for Bean, Lima.
PEA, BLACK EYE							See general statement.
PEA, GARDEN AND FIELD							See general statement.

**VEGETABLE CROPS**

CROP	NEMATICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
PEPPER (CHILI ONLY)	DBCP	50		L	13-26	Preplant, seed, overall.	Limit 26 lb./acre. Wait 7-14 days before planting.
	MBR	30			13  5.7-8.6/14,500 linear ft. of row.	Preplant, transplant, overall.  Preplant, at planting time, postplant, seed, in row.	Wait 14 days before setting plants in treated soil.  Wait 7-14 days before planting. Do not use on bell or pimiento peppers.  Treatment as for Broccoli.
POTATO	EDB	75		L	54-72	Preplant overall.	For control of nematodes other than potato rot nematode, use 2 applications in one season: first, 48-60 lb.; second, 24-30 lb. 10 days later. Treat in fall for control of potato rot nematode in Wisconsin and Idaho. Not for control of cyst nematodes.
				L	72-90	Preplant overall.	
				L in combination with dichloropropenes.	53 EDB in combination with 195 dichloropropenes. Maximum on muck soils or 35 EDB in comb. with 130 dichloropropenes on mineral soils.	Preplant.	Wait 14-21 days before planting.
PUMPKIN							See general statement.

**VEGETABLE CROPS**

CROP	NEMATICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
RADISH	DBCP	75		L	17-24  9-12/29,000 linear ft. of row.	Preplant overall.  Preplant, at planting time, or postplant in row.	
RHUBARB							See general statement.
SPINACH							See general statement.
SQUASH	EDB	50					Treatment as for Bean, Lima.
SQUASH, SUMMER	DBCP	25		L	17-26  9-12/10,900 linear ft. of row.	Preplant overall.  Preplant, at planting time, postplant in row.	Limit 26 lb./acre. Apply 4-10 inches deep.
	EDB	50					Treatment as for Bean, Lima.
SWEET CORN (For Fresh Market)	EDB	50					Treatment as for Bean, Lima.

**VEGETABLE CROPS**

CROP	NEMATICIDE	TOLERANCE (ppm)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY PRECAUTIONS OR RESTRICTIONS
SWEETPOTATO	EDB	50					Treatment as for Bean, Lima.
	V-C 9-104	0.02		G	3-4 (42-inch rows) or 0.025 to 0.033/ 100 linear ft. of row.	Preplant in row.	Allow at least 14-21 days before planting. Apply as band 12-15 inches wide and mix in top 4-8 inches of soil. Limit is 4.0 lb. active/12,400 linear feet.
TOMATO	Bay 25141	0.1		G	10-20	Preplant.	Plant after incorporating granules in soil.
	DBCP	50		L or G	13-36	Preplant overall.	Apply recommended dosage as granules in fertilizer mixture. Do not adjust application rates to meet specific fertilizer requirements. Upper dosage may be phytotoxic. Consult local authorities before using upper dosage.
					6-18/7300 linear ft. of row.	Preplant, at planting time, postplant for direct-seeded tomatoes in row.	
					13/7300 linear ft. of row.	Preplant, postplant for transplants.	Preplant or postplant at least 4 inches from established transplants. Wait 10-14 days before planting.
	EDB	50					Treatment as for Bean, Lima.
	MBR	40					Treatment as for Broccoli.
TURNIP	DBCP	75					Treatment as for Parsnip.